Business Manager
B. Brittain Wilson

Publisher
Edward Lyman Bill

INDIA RUBBER WORLD

Editor
S. C. Stillwagon

Assistant Editor
Edward V. Osberg

Volume 97 | March 1, 1938 | Number 6

Contents

Articles

Departments

Departments

Published monthly by Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y. Cable Address, ELBILL, New York. Subscription $3.00 per year postpaid in the United States and Mexico; $3.50 per year postpaid to Canada; $4.00 per year postpaid to all other countries.

A BILL BROTHERS PUBLICATION

Other Bill publications are: *Premium Practice, Rug Profits, Sales Management, Soda Fountain,* and *Tires.*

INDIA RUBBER WORLD

Published at 420 Lexington Avenue, New York, N. Y.

Volume 97 | **New York, March 1, 1938** | **Number 6**

Latex Molds for Casting Purposes

Edward T. Hall[1]

RESEARCH in numerous fields is being carried on daily high up in Rockefeller Center by the instructors and craftsmen of a unique handicraft school. In the 39 departments of this school, where the full gamut of the creative arts is covered, countless problems arise, many of which are now being solved by a knowledge of the peculiar properties of latex.

Fig. 1. Dr. Frank Black, General Musical Director of N.B.C., Producing Latex Molds as a Hobby

Perhaps one of the most difficult types of problem that has been submitted to the school for solution is to reproduce exactly a specimen, either natural or handmade, into a more permanent form. Heretofore, when the shape of the specimen was intricate, this task was almost impossible, and at best it required hours of painstaking labor on the part of skilled artisans. The solution of the problem lay in the selection of a mold material that would be both economical and sufficiently elastic to permit extrication of the finished casting. This naturally led to the selection of rubber, but this material in its dry form had the disadvantages of requiring expensive processing and equipment. Finally latex was adopted and found to be most successful as it could be fabricated inexpensively by unskilled hands.

Modes for Reproduction

The problem that has faced every sculptor is the difficulty of reproducing his masterpiece into a more permanent form. The original specimen, as shown in Figure 2, may be a wood carving, Plasticene, or soap sculpture, or even a natural specimen such as berries, leaves, or a fragile flower. Soap sculpture is a very popular form of creative expression because of the ease in which the medium may be carved.

Mold Making Process

Although many details arise in mold making which depend upon the size and shape of the object involved, the general procedure is followed in each case. The specimen is coated with a viscous latex of the consistency of cream, especially compounded to provide stiffness when dried; the coating is built up with successive applications until the desired thickness is obtained. Application as shown in Figure 3 is usually by means of one's finger, a spatula, or similar tool, and in the case of small crevices the latex can be gently blown into the recesses. The thickness of the mold wall is determined by the nature and size of the article to be molded, but the ordinary requirement is a thickness of about ¼-inch. If the latex is sufficiently viscous, this can be obtained after two or three coatings. The outer layers are generally reenforced and stiffened by the use of cotton flock or dried latex scrap, which is mixed with the latex before application (Figure 4). After the latex has dried at room temperature, the mold is removed from the form; cutting may be necessary in some cases.

When sectional molds are desired and the matrix is of sufficiently soft material such as Plasticene, pieces of celluloid are inserted in the matrix at the point of desired

[1] Director, Universal School of Handicrafts, Rockefeller Center, New York, N. Y., and Director of the Textiles and Handicraft Division of the New York Museum of Science and Industry.

cleavage to enable separation of the sections (Figure 2).

When necessary to have added support for the rubber mold during the final casting operation, a heavy outer shell may be made of plaster of Paris. In this case depressions and undercuts must have been filled with the latex to produce a more or less regular outer contour. If the rubber mold is to be used in two sections, each part is treated separately, being supported with the external surface downward in a rectangular container into which the plaster of Paris is filled around the mold. To insure perfect registration when the sections are used for molding, wooden pegs are placed in the plaster of Paris wall of the first section. These pegs, which are inserted before the plaster hardens, then produce registering holes in the other section (Figures 5 and 6). To provide for ready separation of the plaster sections, the dividing wall of the first section is coated with grease.

Casting Materials

Another requirement for the transformation of specimens into durable reproductions is an easily workable casting material with the desired physical properties. Plastic Marble, a new development which produces a hard and tough product without kiln firing, falls into this category. It is commercially obtainable as a white powder which may readily be colored before wetting. When mixed with water and an ingredient supplied with the white powder, it gradually hardens during a period of from six to eight hours, finally forming a hard irreversible solid of marble-like quality. It sets, like cement, through a chemical change rather than through the evaporation of water. When liquid, it can be poured into the rubber molds, and in the paste state it can be pressed and worked into the molds (Figure 7). In a somewhat harder condition it may readily be carved.

Other molding materials such as wax, plastic wood, and papier-mâché may also be used with rubber molds.

Specific Uses for Molds

Although latex molds have solved a wide diversity of casting problems, the present discussion will be limited to several of the more important types of technique.

Bayberry Candles

In attempting to make bayberry candles in quantities from wax, hand dipping was found to be too slow and metal molds too expensive. Molds were then made from latex for pouring the wax. The original was whittled from a piece of wood to resemble the shape of a dipped bayberry candle. This was placed in a vertical position on a smooth surface and covered with latex as described above. At the base of each mold a latex collar was formed. A support for a dozen molds was made by cutting holes in a stiff piece of cardboard so that each mold could be suspended from the upper collar. The wicks were then suspended in place and the molten wax poured into the molds.

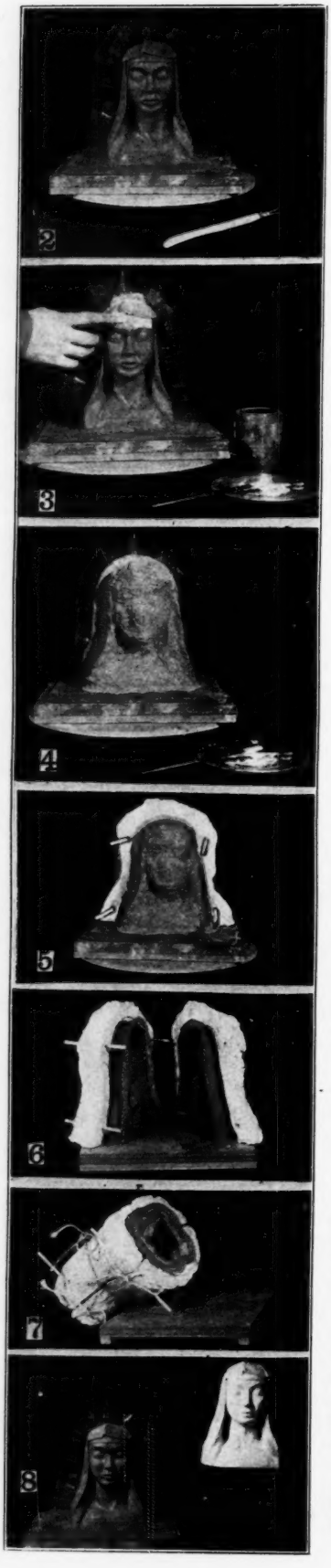


Fig. 2. Plasticene Original with Celluloid Separating Wall. Fig. 3. Applying Latex to Model. Fig. 4. Mold Before Drying. Fig. 5. Mold with Plaster of Paris Backing. Fig. 6. Latex Mold and Plaster Bed. Fig. 7. Plastic Marble Reproduction in Assembled Mold. Fig. 8. Original Model and Finished Casting.

Reproductions of Natural Specimens

A business man from Key West, Fla., wanted for commercial purposes to make tiles upon which would be reproduced the leaves, berries, small flowers, and other natural forms indigenous to Key West. The school showed him how to make molds by pouring latex to a depth of ¼-inch into a rectangular container and impressing the natural specimens in the latex surface. When the latex had set and dried, the specimens were removed leaving a rubber mold which would accurately reproduce every vein and detail of the specimens. Plastic Marble, the consistency of soft putty and colored to reproduce the natural shades, was then worked into the molds; the mold back was built up to form the tile base. After hardening, the tiles were removed from the molds and polished. The reproduced specimens, now in an enduring form, stood out in bold relief with their natural colors.

The most extreme test as yet carried out in the Universal School was the plaque illustrated in Figure 9. The leaves and petals of a natural rose were supported by carefully modeled Plasticene, and the whole specimen was covered with successive coats of latex. The mold was made sufficiently thin and pliable so that it could be flexed and stretched during removal of the final marble casting. The inner faces of the mold contained undercuts which varied from ¼- to ¾-inch in depth, but the use of rubber eliminated difficulties formerly experienced. By the piece-mold process employing a rigid mold material at least a dozen separate parts would be required for such a casting, each very accurately planned so that the different pieces could be assembled before and removed after casting. Experienced sculptors marvel at the ease with which elaborate models with extreme undercuts may now be handled with the rubber mold even by an amateur.

Puppet Replicas

The authentic head of Punch, who according to legend married Judy early in English history, had a protruding nose that hooked far over his upper lip and a chin that sloped upward to almost meet the nose. Those that make puppets realize the difficulty of making a mold from which such a head may readily be withdrawn. The marionette department of the school now models all heads in Plasticene and forms the molds by coating with latex as described above. The mold is then cut vertically in halves just behind the ears. If a plaster bed is used, the mold wall may be relatively thin. Each section of the mold is coated inside with Plastic Marble, plastic wood, or papier-mâché. As the heads are usually hollow, only a thin coating is required. The two halves are pressed together while the casting material is still soft, and the finished head may be removed a day or two later. The head is finished by smoothing the lines where the mold sections meet.

Fig. 9. *Left*—Casting and Mold of a Rose; *Right*—Marionette Head with Half Mold

Costume Jewelry

Costume jewelry necessitates constant development of new molds because styles change so rapidly. The school has shown manufacturers how to make latex molds literally overnight to meet any new trends in design. Plastic Marble and other new substances that are light, strong, and capable of hardening in a limited time are helping latex molds in the solution of this problem.

American inventiveness and resourcefulness, which have built our world position in past decades, is still pioneering in new techniques, materials, and their applications.

Rubber Diving Suit Marine

ON DECEMBER 2, 1937, a new deep-water diving record was established when Max E. Nohl, of Milwaukee, Wis., descended 420 feet into Lake Michigan, thus breaking the previous world's diving record by 110 feet. The first suit of its kind pictured here was worn during this feat.

After being discouraged by the makers of conventional types of diving suits and leading rubber companies, Mr. Nohl presented his design and details of his requirements to H. Tom Collord, president of Collord, Inc., Detroit, Mich., who decided that his firm could build the suit.

When one considers the terrific pressure of water at 420 foot depth, 181 pounds to the square inch, or more than 600,000 pounds on the entire area, one can appreciate the necessity of flawless construction and insurance against splitting, tearing, or leakage.

Rubber-Coated Diving Suit Worn in Record-Breaking Descent

Extends Scope of Salvage

A pattern was made, from which a canvas foundation was cut and carefully sewed. On this foundation Collord applied, by its exclusive SRL method, rubber in solution until a coating had been formed, $\frac{1}{16}$-inch thick on the inside and $\frac{1}{8}$-inch on the exterior, graduated to $\frac{1}{4}$-inch on the shoulders and neck section. The result was a seamless and continuous rubber unit without a lap, welt, or break, from top to toe. This suit is considered to be the strongest and safest diving suit ever built.

The record dive proved the feasibility of the proposed expedition to photograph the *Lusitania,* which lies in 310 feet of water off the Irish coast. It opens up fascinating possibilities in the salvaging of sunken treasure valued at many millions of dollars that lie in lost ships on the ocean bottom in many parts of the world.

Superheated Water[1]

COMMERCIALLY known as the "Supertherm" system, this method of supplying process heat is claimed to effect fuel savings of 30%. The system employs water under pressure at temperatures above 212° F. The process hot water is drawn directly from the drums of steam boilers and returned after use in a completely closed system. Normal steam generating boilers can be used with a water level higher than usual and with outlet and return connections below the water line. Water transmission is by circulating pumps, and the pipe system should contain provision for removing trapped air.

This system has been employed since last summer in the new General Electric plastic molding plant at Pittsfield, Mass., where about 6,000,000 B.T.U.'s per hour are supplied to 324 presses by hot water exclusively. The installation was made by J. O. Ross Engineering Corp., which is fostering the "Supertherm" system in America. The system, although widely used in Europe, is relatively new in America and would appear to have some advantages for mold and closed system vulcanizers as well as heating calender rolls.

[1] Abstracted from *Power,* Jan., 1938, pp. 56-57.

Fiberglas and Rubber

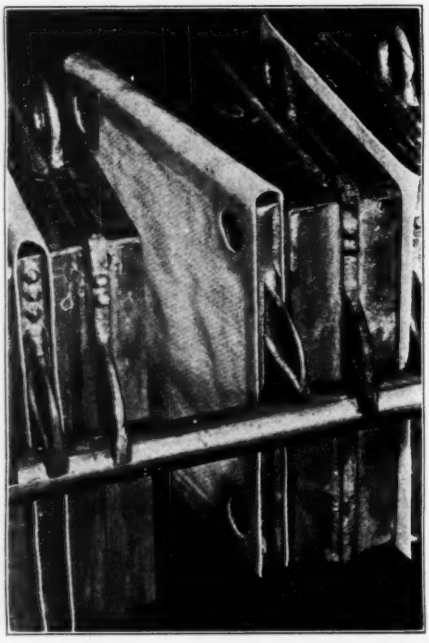
J. H. Plummer[1]

Woven Fabrics and Tapes Made of Glass

FREQUENTLY in the past rubber and glass have performed complementary functions; today, with glass in the form of very fine fibers, there is every reason to believe that many more useful products may be made from combinations of these two materials.

Properties

Fiberglas possesses a number of properties which differentiate it from any other type of fiber. It is completely inorganic, will not rot, mildew, or decompose in the presence of heat or light. These properties, together with its high tensile strength (250,000 pounds per square inch), its chemical resistance, and the ease with which it may be fabricated into yarns or fabrics, have already led to a number of new products.



Latex Impregnated Fiberglas Fabrics on a Filter Press

Fibrous Glass

In the air conditioning field latex compounds and glass are used for air filters and eliminator mats. Filters are made by first forming a thin pack of coarse fibrous glass, coating the fibers with a latex compound as a binder, and again coating the fibers with an adhesive material to catch and hold the dust. By varying the fiber diameter and the density of the packs, and also the number and the type of packs in the container, any number of filters may be made to meet widely varying requirements. Fibrous glass bonded with a rubber binder has also been used in the production of battery separator plates. These have been used extensively in foreign countries, but their application in this country has been limited. Under severe test conditions batteries made with Fiberglas separators have been found to be in first-class condition after the end of two years. Battery cases have also been made in which the coarse Fiberglas has been used to replace cotton linters. These cases were much less porous and more resistant to the action of acids.

Woven Glass

In the field of chemical filtration, Fiberglas is used in the form of woven fabrics. These fabrics, while they possess excellent chemical resistance to all acids except hydrofluoric, do not resist severe abrasion or high pressures successfully. Because of this deficiency, the first experiments on plate and frame presses were very unsatisfactory. Later these fabrics were impregnated with latex compounds wherever pressure was exerted. Now these cloths are being used to filter hot acids, and when synthetic rubbers are applied, these same fabrics may be used for the filtration of hot oils. Glass will operate at temperatures which would break down the usual cotton in a relatively short time. Furthermore, since the fiber is inorganic, it has no tendency to swell and thus decrease the flow rate. The fibers from which these cloths are made have an average fiber diameter of 0.00025-inch, which is considerably smaller than any other textile fiber. Consequently a filter cloth made from fibrous glass can provide a higher efficiency than a cotton cloth at the same flow rate or a much higher flow rate at the same efficiency.

Other Developments

As a filling or extender, Fiberglas makes even a soft rubber compound very stiff. This point was demonstrated when several golf balls were made with a high glass content in the covers. Also others were made with latex impregnated Fiberglas strands for cores. These balls were sufficiently elastic to pass all of the driving tests, but they could not withstand the cutting action of a heavy club descending on top of them.

(*Continued on page* 48)

A Few Types of Glass Yarn

[1] Industrial and Structural Products Laboratory, Owens-Illinois Glass Co., Newark, O.

Sponge or Expanded Rubber

Joseph Rossman

THE following abstracts conclude the informative article about sponge rubber, continued from our February issue.

54. Graz, 1,981,722, Nov. 20, 1934. A process for producing porous rubber comprises forming a raw rubber mixture containing enough urea to constitute a blowing agent, filling a mold only partially with the mixture, vulcanizing the mixture in the mold, puffing the mixture by the action of urea during vulcanization, and thus filling the mold with porous vulcanized rubber.

55. Hauser, 1,982,385, Nov. 27, 1934. The process of manufacturing rubber articles having clearly defined microporous and non-porous portions comprises forming the article of microporous gel, drying the portions to be non-porous to remove the water therefrom while preventing the removal of the water from the other portions, vulcanizing the entire article, and during vulcanization keeping the microporous portions moist and isolating the dried non-porous portions from such moisture.

56. Riley, 1,983,677, Dec. 11, 1934. The method of making sponge rubber articles comprises assembling a plurality of thin sheets of sponge rubber composition upon a reticulated form to provide an unvulcanized article having the shape of the finished article and vulcanizing the article while on the form by the application of heat.

57. Madge, 1,985,045, Dec. 18, 1934. A process for the manufacture of microporous articles of vulcanized rubber material from aqueous dispersions comprises coating a molding surface with a stearate of a metal of the group consisting of zinc, cadmium, and iron, forming a body of dispersions in contact with such surface, gelling the dispersion, and vulcanizing while preventing the evaporation of water therefrom.

58. Minor, 1,990,460, Feb. 5, 1935. The process of manufacturing sponge rubber from latex comprises adding vulcanizing ingredients to the latex, charging it with an inert gas under pressure, and vulcanizing the compounded latex, permitting the water in it to escape therefrom, but retaining the inert gas in the rubber by conducting the steam from the vulcanizing chamber and condensing it.

59. Forbes, 1,990,937, Feb. 12, 1935. The process for making cork and sponge rubber articles consists in milling together a rubber binder, a vulcanizing agent, and a blowing compound decomposable under heat to evolve a gas, and after milling is substantially completed mixing in granulated cork without substantial reduction in granule size of the cork to form a homogeneous mixture, shaping the mix, blowing, and vulcanizing.

60. Madge, 1,991,860, Feb. 19, 1935. A process for the manufacture of microporous articles of vulcanized rubber from aqueous dispersions of rubber material comprises admixing in the dispersions an aromatic di-substituted guanidine, heating the dispersions to gel the dispersion, and vulcanizing the products so obtained under such conditions that evaporation of the liquid contained in the pores or micropores is prevented.

61. Murphy, 1,993,279, Mar. 5, 1935. A process for the manufacture of microporous goods of vulcanized rubber in admixture with fibrous materials comprises mixing fibrous materials with flocculent or granular precipitates in aqueous suspension produced from aqueous dispersions of rubber material, filtering the mixture of flocculent precipitates and fibrous materials to a compact mass, and vulcanizing the products so obtained while preventing evaporation of the liquid contained therein.

62. Twiss, 1,993,290, Mar. 5, 1935. To produce cellular rubber freeze an aqueous dispersion of material comprising rubber and vulcanizing reagents in a predetermined form, then heat the solidified structure at a vulcanizing temperature while retaining the water of the dispersion within the structure formed by freezing it.

63. Gorham, 2,001,305, May 14, 1935. A method of forming plates of microporous rubber comprises inserting mold plates in spaced relation into a body of aqueous dispersion of rubber material by a relative movement of the plates edgewise into the body of dispersion, thereafter bringing the plates to a predetermined spacing, gelling the dispersion, and vulcanizing it without the loss of any water.

64. Clark, 2,008,242, July 16, 1935. The method consists in vulcanizing a mixture of rubber and sulphur, comminuting the fully vulcanized mixture, mixing it with an aqueous solution containing sulphur, molding the resulting mixture under pressure, and heating in its mold, whereby the particles of the comminuted mixture are knitted together by the sulphur of the aqueous solution, while the water of the aqueous solution is evaporated during this further vulcanization so as to form interstices between the particles.

65. Minor, 2,017,217, Oct. 15, 1935. The process of manufacturing sponge rubber comprises subjecting triethanolamine to the action of carbon dioxide gas for a sufficient period so that it will absorb many times its volume of the gas, incorporating the triethanolamine so treated in a rubber compound at low temperature, and vulcanizing the rubber whereby the gas is released throughout the mass to form cells therein.

66. Milan, 2,017,398, Oct. 15, 1935. A process for the manufacture of sponge rubber consists in coagulating an aqueous rubber dispersion in the presence of a temporary pore-forming core material distributed through the dispersion and consisting of beads, grains, pellets, or fragments of a substance selected from the following: glue, gum arabic, agar-agar, gelatine, gum tragacanth, dextrine, starch, molasses, a colloidal product of partial hydrolysis of starch or cellulose, and thereafter extracting the core material to leave a porous product.

67. Flemming, 2,019,489, Nov. 5, 1935. A method of manufacturing sponge rubber comprises mixing rubber, a blowing agent, and a vulcanizing agent including an accelerator, shaping the compound before curing, submerging the shaped mass in a heated liquid bath at a temperature and for a time sufficient to vulcanize the surface quickly, and then to blow and complete the vulcanization, thereby

retaining the shape of the uncured mass throughout the blowing and vulcanizing operation.

68. Chapman, 2,020,994, Nov. 12, 1935. A process of manufacturing rubber goods of cellular or foam structure comprises forming a foam of an aqueous rubber dispersion, and after the foam is formed, decreasing the pressure surrounding the foam below the pressure within the cells thereof so as to expand the cells, and vulcanizing the expanded structure.

69. Dodge, 2,023,268, Dec. 3, 1935. The method of making a strip of rubber material comprises forming an unvulcanized rubber core, applying thereto a layer of sponge rubber composition, vulcanizing the strip while it is enclosed in a mold, depositing a layer of rubber over the assembled strip from an aqueous dispersion of rubber to provide an impervious cover, and vulcanizing the cover.

70. Trobridge, 2,023,296, Dec. 3, 1935. A process for the manufacture of goods of rubber material of sponge-like or cellular structure from aqueous dispersions comprises admixing into the dispersions ammonium sulphate and finely divided magnesium metal to produce an inflating agent and a coagulating agent and permitting the resulting frothy mass to set to a permanent structure of irreversible solid material.

71. Hiers, 2,029,617, Feb. 4, 1936. A sponge rubber is formed from an aqueous rubber dispersion containing borax and a vegetable gum coagulable by the borax, and a cell-forming agent.

72. Linscott, 2,032,942, Mar. 3, 1936. The process for manufacturing a rubber sheet having a plurality of perforations therethrough, comprises applying a latex composition to a deposition backing, concurrently drying or gelling the latex coating and piercing the film with a plurality of air jets to form permanent perforations therein, and removing the perforate film or sheet from the backing.

73. Kershaw, 2,043,954, June 9, 1936. A porous separator and retainer for storage batteries permeable to an electrionic flow and substantially non-hydrolyzable in a storage battery comprises in major part particles of diatomaceous earth in spaced relation providing pores and bonded to form a solid mass by scattered particles of vulcanized rubber latex.

74. Reinhardt, 2,052,490, Aug. 25, 1936. The method of making microporous articles comprises applying to a fabric strip successive layers of a latex-water jelly by passing the strip a plurality of times first through a jelling solution and then through a latex compound and vulcanizing the mass without permitting the escape of the retained water.

75. Chandler, 2,055,002, Sept. 22, 1936. A process of producing a foraminous rubber-coated textile fabric material consists in providing a sheet of textile fabric material coated with unvulcanized rubber, piercing this material by a needle-like instrument thereby to perforate the coating to provide minute openings and spread apart the fabric strands, and thereafter vulcanizing the rubber coating.

76. Frankfort, 2,057,442, Oct. 13, 1936. The method of producing chlor-rubber bodies having microscopic pores comprises introducing a solution of chlor-rubber containing a solvent into a mold, permitting the partial evaporation of the solvent from the solution to form a partially dried body, removing the partially dried body from the mold, and permitting complete evaporation of the solvent whereby a body of chlor-rubber is produced having fine pores capable of permitting the passage of air, but preventing the passage of water.

77. Bird, 2,059,203, Nov. 3, 1936. Sheet rubber comprises a layer of vulcanized sponged rubber on one side, a layer of vulcanized rubber on the other side which contains a sponging agent limiting the sponging of the rubber to only a slight amount, and an intermediate portion of rubber coalesced with the inner portion of the vulcanized sponge rubber and the inner portion of the vulcanized rubber which constitutes commingled portions of each of the layers. The sheet has no line of demarcation between the layers thereof.

78. Robinson, 2,059,278, Nov. 3, 1936. Strong, springy, resilient, soft sponge rubber is obtained by drying the desired amounts of animal or vegetable fibers and rubber, then mixing the dried rubber and fibers with a relatively heavy mineral oil to render the fibers water repellent, then adding to the mixture the usual ingredients of gassed or sponge rubber stock including chemical gasifying agents, mixing, and vulcanizing the stock.

79. West, 2,066,596, Jan. 5, 1937. A process of making porous separators consists in extruding upon the surface of a moving strip of cloth a continuous mold of plastic material, flowing on to it a stream of rubber latex mixture, heating to convert the latex into a jelly, and rolling the cloth and rubber mixture and plastic material on to a drum for vulcanization.

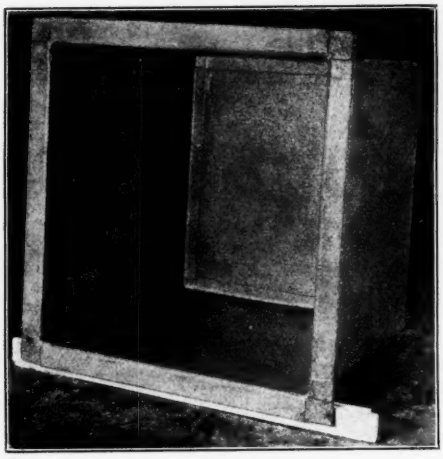
80. Roberts, 2,067,020, Jan. 5, 1937. The method of manufacturing expanded rubber comprises masticating and milling rubber, resting the masticated rubber to restore its "nerve," forcing out occluded air from the rubber, impregnating the rubber with air-free inert gas-occluded charcoal particles of which the inert gas does not react with rubber, and heating the rubber to expand the gases within it and consequently also expanding the rubber, and then carrying the vulcanization of the material to its completion.

81. Miller, 2,071,647, Feb. 23, 1937. The process of producing configured rubber sponge comprises proceeding in the formation of rubber sponge until the rubber has attained cellular formation, removing material to present a surface in cut-section, and changing the sponge density selectively, to produce different sponge densities at different places, to effect configuration at least of the cut-section surface, and with the cut-section remaining in cut-section.

82. Roberts, 2,086,513, July 6, 1937. The method of making an expanded rubber comprises inserting a substantially air-free rubber composition into an autoclave, evacuating the autoclave, admitting to it an inert gas having no affinity for rubber at a pressure of from 150 to 200 atmospheres, heating the autoclave to the temperature by steam of the order of 8 to 16 pounds' pressure partially to vulcanize the rubber, thereafter removing the rubber, and within a predetermined interval completing the vulcanization.

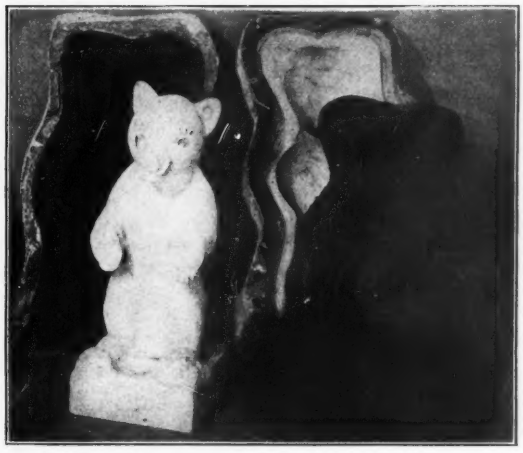
83. Burgess, 2,096,933, Oct. 26, 1937. The process of making a semi-rigid microporous electrolytic diaphragm having ionic permeability consists in preparing a dry admixture of a finely divided hydrophilic substance with rubber and sulphur in a proportion suitable for vulcanization to hard rubber, mechanically shaping the mass while in the dry state, subsequently swelling the hydrophilic particles by subjecting the mass to aqueous moisture, and then setting the binder by the application of heat in the presence of moisture.

84. Winkelmann, 2,098,365, Nov. 9, 1937. A porous oil resistant mass comprises vulcanized rubber hydrochloride having uniformly distributed pores of the same size as in rubber sponges.



Koroseal-Lined Steel Tank for Nitric Acid

Koroseal Covered Textile Roll



Korogel Mold and Plaster Cast Product

Koroseal A, B, C's

H. E. Fritz and S. L. Brous[1]

KOROSEAL,[2] a product of research,[3] is a synthetic elastic composition, rubber-like, but not a rubber derivative, and it contains no rubber. Technically it is a plasticized special polyvinyl chloride. Koroseal in its solid form is produced in hardnesses ranging from that of bone to that of a very soft gel. Each compound is capable of further variation by change of plasticizer and/or pigments for coloring, stiffening, and changing other physical properties. The extremely soft grade is known commercially as "Korogel." With specially selected solvents it is possible to obtain solutions of these products. Specifically formulated, such solution is known commercially as a "Korolac."

In presenting the following résumé of properties an attempt has been made to define only the present limits of each characteristic. It is obvious that with so many compounds already prepared and with an infinite number possible, no absolute values can here be given.

Properties

ABRASION RESISTANCE: Koroseal is excellent in sand-blast type where a minimum of heat is generated. It is not yet recommended for service where unlubricated, frictional-type abrasion occurs.

ADHESION: Commercial processes are not yet available for adhering the solid forms to standard materials of construction. However by the use of Koroseal solutions it can be made to adhere quite firmly to paper, fabrics, and other porous materials.

AGING: See also oxidation. After as much as four years' exposure to the weather, tests specimens show no apparent deterioration.

COLOR: By using standard pigments or dyes, a complete range of colors can be produced. In its natural state Koroseal is light amber to brown.

COMPRESSION SET: This characteristic varies considerably according to the compound and, obviously, with the method of test. The minimum is 1% measured 30 minutes after release from 400 pounds per square inch constant load at room temperature for 22 hours. In general, the set in Koroseal compounds is greater than in rubber stocks.

COMPRESSIBILITY: For practical purposes Koroseal is non-compressible; i.e., regardless of distortion the volume remains constant.

CORONA RESISTANCE: Excellent for all forms.

CORROSIVE RESISTANCE:[4] Suitable for both acids and alkalies.

DIELECTRIC STRENGTH: 250-850 volts per mil (on 95 mil sheet with 2″ electrode).

DIELECTRIC CONSTANT: At 30° C. and 10^3 cycles—3 to 9.
At 30° C. and 10^4 cycles—3 to 9.

ELONGATION: This characteristic may be varied from 2 to 500% by increasing the plasticizer content. In other words, within certain limits the softer the stock, the higher the elongation. See tensile strength.

FLAME RESISTANCE: Like most materials containing a high percentage of halogen, Koroseal will burn only when held in a direct flame.

FLEXING LIFE: The medium hard to soft grades perform well in continuous flexing. In comparative tests with rubber compounds Koroseal showed a flex resistance ten times that of rubber.

FRICTION, COEFFICIENT OF:

	Bone Hard Compounds	Soft Compounds
Dry	.13 to .16	1.20 to 1.80
Lubricated	.13 to .16	.05 to .10

GRAVITY, SPECIFIC: 1.20 to 1.40 (unpigmented).

[1] B. F. Goodrich Co., Akron, O.
[2] Trade mark, copyrighted.
[3] Brous and Semon, *Ind. Eng. Chem.*, 27, 667 (1935).
[4] For complete list of corrosives, see *Chem. Met. Eng.*, 43, 560 (1936).

GRINDING: See machining qualities.

HARDNESS: Koroseal compounds are thermoplastic, the hardness varies with the temperature. When measured at room temperature, hardnesses varying from 15 to 100 (measured on Shore Soft Rubber Durometer) can be produced by proper compounding.

HEAT RESISTANCE: No appreciable chemical changes take place on exposures of several hours, to temperatures up to 285° F. (140.5° C.). On long exposures at or above 285° F. thermal decomposition takes place, resulting in a hardening of the stock. Because the material softens as initial heat is applied, the maximum recommended service temperature is 170° F. (76.7° C.).

IMPACT STRENGTH: At room temperature the impact strength of the harder compounds approximates 100 inch-pounds per square inch of cross-sectional areas. The softer compounds do not shatter.

IMPREGNATION: Solutions of Koroseal are definitely superior to rubber latex and cements in the impregnation of paper, cotton, and wool.

LIMITATIONS: Koroseal is not now recommended where service conditions require complete and constant immersion in: 1 organic compounds containing nitro or chlorine groups; 2 aliphatic or aromatic ketones; 3 aromatic amino compounds; 4 gasoline or lacquer solvents.

MACHINING QUALITIES: Soft compounds can be lathe cut and ground. Hard compounds can be turned, drilled, or sawed.

MOLDING QUALITIES: Koroseal can be readily molded. The shape of the desired article determines whether a flash or a plunger-type mold is required.

MOLD SHRINKAGE: 0.017-inch per inch (average).

NON-COMPATIBILITY: New technique has made it possible to mix small quantities of rubber or Neoprene with Koroseal. For practical purposes, however, Koroseal may be considered as being non-compatible with rubber, Factice, cellulose ethers and esters, and synthetics of the Neoprene and "Thiokol" types.

ODOR: Unlike most other synthetic materials, Koroseal is substantially odorless.

OILS, RESISTANCE TO: Koroseal does not swell or disintegrate in vegetable or mineral oils. However it does shrink slightly at normal temperatures. This property has become increasingly important in the solution of problems where such a characteristic is an advantage rather than a disadvantage.

OXIDATION: The product is substantially unaffected by both natural and accelerated oxidation.

OZONE RESISTANCE: Completely resistant.

PROCESSING: Koroseal is processed on standard rubber processing equipment. It may be milled, molded, extruded and tubed, calendered and frictioned, and coated on fabrics or paper. Solutions may be applied by spreading, dipping, or printing.

POWER FACTOR:

At 30° C. and 10^3 cycles—1 to 15 } dependent on
At 30° C. and 10^4 cycles—1 to 15 } compound.

QUALITY: New developments together with close supervision and technical control have pointed toward continually improved quality of all products. Uniformity is virtually assured.

SOLVENTS, RESISTANCE TO: At normal temperatures Koroseal may be expected to resist solvents other than those listed under "Limitations" as above.

STABILITY: Koroseal gives off no volatile products and is indefinitely stable at normal temperatures. At extremely high temperatures thermal decomposition occurs rather rapidly, as might be anticipated from an organic compound. Even so, the product will stand 10 hours' heating at 302° F. (150° C.) without appreciable decomposition, and this temperature is considerably above that of practical service temperatures.

SUNLIGHT, RESISTANCE TO: The material in the newer forms is practically unaffected.

TASTE: Most compounds are substantially tasteless.

TENSILE STRENGTH: This characteristic may be varied from approximately 1,000 pounds per square inch to approximately 8,000 pounds per square inch. See also elongation.

TOXICITY: Special compounds are available which are believed to be non-toxic.

VOLUME, SPECIFIC: 23.0 to 19.8 cubic inches per pound (unpigmented).

VULCANIZATION: Standard compounds are true thermoplastics and, as such, are not susceptible of vulcanization. Laboratory technique has made it possible to reduce the thermoplasticity of certain stocks by a combination of thermal and chemical treatments. These processes, however, have not yet been adapted to commercial products.

WASTE: Processing operations involve very little lost material since scraps, mold trimmings, etc., may be reworked without chemical reclaiming treatments.

WATER RESISTANCE: Koroseal is practically unaffected by water. Water absorption—% (immersion) in 30 days —1.1.

Applications and Uses

The needs of modern industry for an engineering material having at least some of the desirable characteristics of rubber, but without many of its disadvantages have promoted the development of this product. Many of the following applications and uses are obvious from a cursory study of the foregoing properties. For those applications which are not so obvious, diligent effort has made the product adaptable.

A. Auto topping—treated fabric; aviator's clothing—treated fabric and skins; awnings—treated fabric.

B. Belts—transmission and conveyer, for service in oils and greases; beverage tubing.

C. Cable insulation and sheathing; capsules for pharmaceuticals; caulking materials for oil, grease, and corrosive service; chemical tubing for laboratory and factory operations.

D. Deck covers for marine service; diaphragms for pumps and meters; die run items—miscellaneous mechanical.

E. Expansion joints.

F. Fabric—frictioned and coated — for miscellaneous service; fabric—impregnated; flame retarder.

G. Gaskets for oil, water, corrosives, etc.; gloves for corrosives and oils and greases.

H. Hospital sheeting; householdware such as shower curtains and window curtains.

I. Injectors for steam in acid and alkali baths; insulations (heat), at recommended service temperatures.

J. Jacks, hydraulic seals.

K. Kaiak and canoe coverings.

L. Lamp shades; luting material.

M. Magnet coil insulation and protection; masking in pottery industry; masking tape; matrices for casting of plaster of Paris and other synthetic stones.

N. Nets—fish, lobster, et al.; nozzles for spray and grease guns.

O. Oil can tips; oil sucker rod packing.

P. Packing, sheet and molded, for oils, greases, and corrosives; paper, coated, for packaging; personal wear such as raincoats, aprons, and shampoo capes; plating rack protective covering.

(*Continued on page* 46)

Research on Latex Colloidal-Clay System[1]

A. van Rossem and J. A. Plaizier

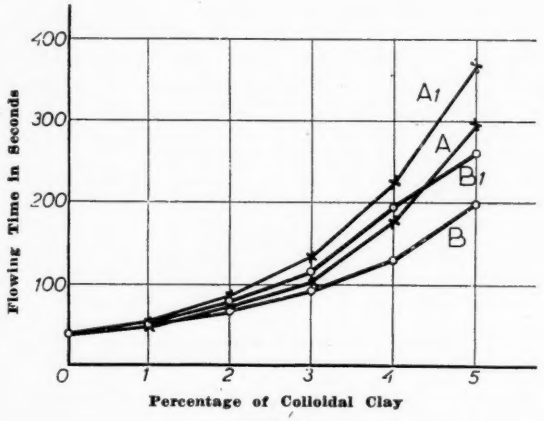


Fig. 1

Increase in the Viscosity of Latex by the Addition of Colloidal Clay. A. Mixes with Colloidal Clay No. 2; A_1. Same after Resting 72 Hours; B. Mixes with Colloidal Clay No. 3; B_1. Same after 72 Hours' Resting

SEVERAL studies are to be found in the literature of rubber and latex on the use of colloidal clay in latex mixes, but it is worthy of note that the different purposes for which the colloidal clay is used are merely indicated; while every scientific explanation, completed by quantitative arguments, is entirely lacking.[2]

For instance, colloidal clay is used to increase the viscosity of latex, but quantitative figures are wanting. For this reason it was important to subject the latex colloidal-clay system to a more quantitative, scientific investigation, some of the results of which we give in this communication.

We propose to give the results of our research work on increasing the viscosity, decreasing the adhesion of a film of dried latex, the reenforcement of rubber by colloidal clay, and the flocculation of the latex colloidal-clay system.

Increasing the Viscosity of Latex

It is known that the viscosity of latex can be raised by increasing its concentration; yet in many industrial cases it is not desirable to use a highly concentrated latex, and for this reason it is very useful to have available a substance like colloidal clay which increases viscosity.

We determined the viscosity of latex and of latex colloidal-clay mixes by means of a Gorter pipette. Mixes were made in which the concentration of colloidal clay varied in proportion to the rubber present, and the rate of flow of these mixes was determined in a Gorter pipette. We tested several kinds of colloidal clay, and the results of two of these series of tests are given in Figure 1.

From these results it may be concluded that:

1. Colloidal clay effects a considerable increase in the viscosity of the latex, depending on the quality of the colloidal clay employed.

2. When the mix was aged, for 72 hours for instance, the viscosity increased considerably, which action is no doubt connected with the thixotropic properties of these mixes.

Decreasing the Adhesion of Latex Films

It is a well-known fact that latex, after drying, produces a very adhesive film of rubber. In many cases this is a desirable property, but there are also industrial applications of latex in which this quality leads to difficulties. To prevent this stickiness, we added colloidal clay to the latex, and the preliminary tests gave positive results.

Then we made quantitative tests. To this end we prepared—by drying—films of rubber from latex to which progressively increasing quantities of colloidal clay had been added. One portion of these films was reenforced with a fabric. After they were dry, two of the films were stuck together. For this purpose we constructed a little cart with two rolls, loaded with the requisite weights, which rolled over the two films of rubber. The next day the adhesive power of the two films was determined by means of the Schopper dynamometer, according to the usual method of determining the adhesion of the different plies in a belt. We carried out these tests with different weights. The results obtained are shown in Figure 2.

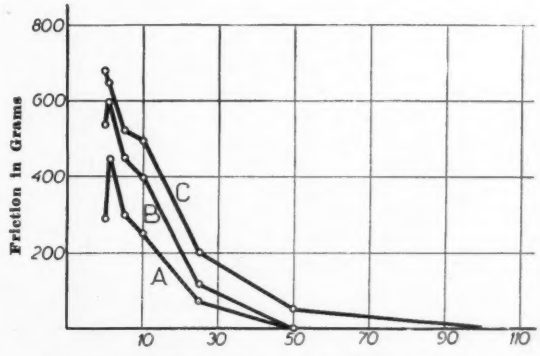


Fig. 2

Decrease in the Adhesion of a Layer of Dried Latex by the Addition of Colloidal Clay. A. With a Weight of 8.5 Kilos; B. With a Weight of 23.5 Kilos; C. With a Weight of 48.5 Kilos

[1] Paper presented at the International Congress, Paris, France, June 29, 1937. Reprinted from *Rev. gén. caoutchouc*, Sept., 1937, pp. 19-21.

[2] See, for instance, the following: INDIA RUBBER WORLD, 87, 6, 37 (1933); "Bentonite, Technical and Industrial Uses," issued by American Colloid Co., Chicago, Ill., 1935, p. 202 c.; W. B. Hirschmann, *Rubber Age (N. Y.)*, 41, 89 (1937).

As the figure indicates, the addition of a very small amount of colloidal clay appears to give a certain increase in the adhesive power, but with progressive quantities, this property decreases fairly rapidly. The pressure applied also has a certain effect, which is readily understandable.

Colloidal Clay as Reenforcing Filler

Latex mixes with progressive amounts such as 5, 10, 20, and 30 parts of colloidal clay to 100 parts of rubber are dried on horizontal glass plates, and the films thus obtained are subjected to tensile tests carried out with the Schopper dynamometer.

The tensile curves which were obtained are shown in Figure 3.

As we see, the colloidal clay mixed with the rubber in the latex considerably reenforces the rubber film. It is worth emphasizing that colloidal clay mixed in crude rubber has no reenforcing effect; whereas the same material added to latex gives unusual reenforcement. On the other hand carbon black exercises a reenforcing action when mixed with plasticized rubber, but not on latex mixes. We may say that latex and colloidal clay are two hydrophile systems which mingle much more intimately when in contact with water.

Influence on Coagulation

When a sufficient quantity of acetic or formic acid is added to latex, immediate coagulation is obtained. De Vries and Belgrave have shown in their admirable works that coagulation comprises two successive phenomena, that is to say, flocculation, an electrical phenomenon, and coagulation, which is a phenomenon of adhesion.

If acid is added to latex after a certain amount of colloidal clay has first been mixed with the latex, then flocculation and not coagulation is obtained, and no coalescence is produced. This is a very remarkable phenomenon and at the same time very important.

We determined the minimum quantity of colloidal clay that must be added in order to obtain a flocculate by subsequent addition of acid to progressively concentrated latices. The results of this study are reproduced in Figure 4.

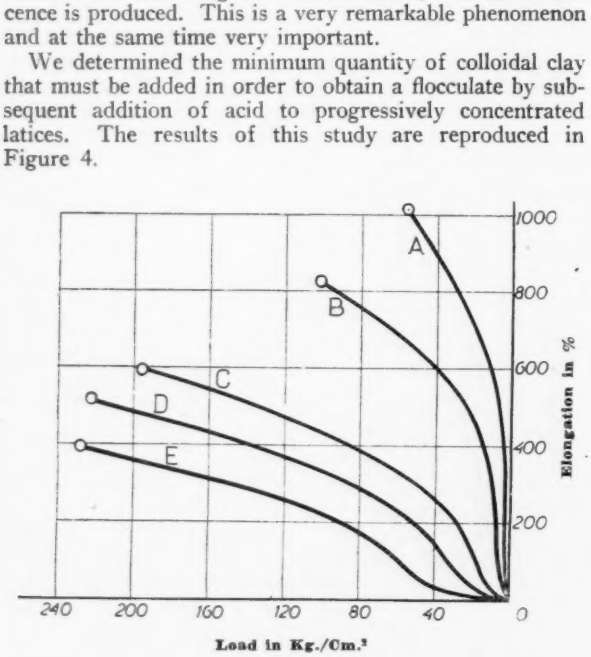


Fig. 3
Colloidal Clay as Reenforcing Material in Rubber. A. None; B. 5 Parts; C. 10 Parts; D. 20 Parts; E. 30 Parts of Colloidal Clay on 100 Parts of Rubber

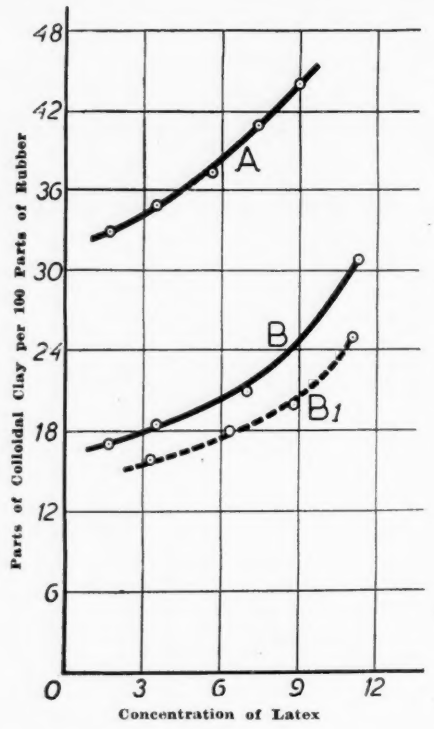


Fig. 4
A. Colloidal Clay No. 1 at 20° C.; B. Colloidal Clay No. 3 at 20° C.; B1. Colloidal Clay No. 3 at 70° C.

The conclusions from this investigation are listed as follows:

1. When the concentration of the latex increases, the rate of increase in the amount of colloidal clay required is proportionately more rapid.
2. Different kinds of colloidal clay give different results.
3. At elevated temperature a smaller quantity of colloidal clay is necessary to produce flocculation, but the influence of temperature is not very important.

Concluding Remarks

As to the cause of these phenomena, Dr. C. F. Vester, who has carried out some colloidal investigations, is of the opinion that colloidal clay probably acts primarily as a filling material, but we hope to publish these results in another paper when the current experiments have been concluded.

In the course of our investigations we found that zinc oxide added to the latex colloidal-clay system behaves like an acid; flocculation is obtained, but this gradually changes into coagulation. We are of the opinion that this flocculation is probably caused by a complex zinc ion, but we have not gone into this phenomenon more deeply.

Finally we wish to call attention to the fact that flocculation by means of colloidal clay is of great importance in the industrial application of latex. It is possible to add to a latex and colloidal clay mix, fillers of all kinds, accelerators, and sulphur, and then to make a flocculate by adding acid. This flocculate may be strained and then dried. When fibers are used as fillers, paper and cardboard containing rubber can be obtained by passing through a paper-making machine.

We have also succeeded in preparing a rubber powder containing fillers by this method, patent for which has been applied for.

Latex Research in Malaya[1]

THE following résumé outlines the more significant results of the investigations on Latex conducted by the Rubber Research Institute of Malaya and its London Advisory Committee during the year 1936.

Latex Constituents

The true and cyclic "sugars" as well as the bulk of the fatty acids of fresh latex have been shown to occur in chemical combination and not free or as soluble metallic soaps as has been freely assumed in the past. From the point of view of explaining in chemical terms the changes which take place in the properties of ammoniated latex on storage, the discovery of the various latex complexes is of great value. Analyses of latex from the same estate source have indicated that weather conditions play a very important part in determining variation in the composition of latex.

Treatment of Shipment Vessels

In connection with container lining attention has been given to the latex-zinc oxide filming technique with particular reference to the reduction in latex stability. Experiments have been made with latex films containing zinc oxide together with other ingredients chosen to lessen the adverse effect on stability while at the same time not impairing the adhesiveness of the film. Comparative stability tests on latex stored in contact with the simple latex-zinc oxide film indicated that one of the modified films was at least partially successful from the standpoint of stability.

A new bituminous preparation suggested itself as being suitable for coating second-hand drums. Laboratory storage tests with treated metal strips in freshly ammoniated latex, and also in latex partially putrefied in presence of the strips before ammoniation and storage were encouraging. Discoloration of the latex did not occur during five weeks' storage, and the film itself was in good condition at the end of that period.

Physical Properties and Test Methods

COLOR AND ODOR. In order to obtain color standards for latex a modified outfit of color slides was prepared consisting of nine shades; the basic color was white with a very slight trace of yellow.

The "boric acid test," which consists in treating the latex with an equal volume of a saturated solution of boric acid and judging the odor immediately by smelling, has been applied with fair success.

STABILITY. The stirring-stability apparatus devised in the laboratories of the London Advisory Committee has been in continuous use and differs from the type of apparatus in most common use in America in that it employs a comparatively slow moving paddle (600 r.p.m.) and stirring is carried out in the presence of zinc oxide. In view of the irregular results given by this method a study was made of the following variable factors: the quantity of latex of a fixed dry-rubber content, the amount and grade of zinc oxide, the speed of stirring, the ammonia content of the latex, and the temperature of testing. Following this investigation standardized conditions were adopted enabling satisfactorily reproducible results to be obtained. The chief defect of the test is the time required for coagulation (from one hour to more than 24 hours). Other coagulants are being tried, and sodium silicofluoride appears promising. The method of very rapid stirring, in use in America, was submitted to a preliminary investigation, but it was found difficult to obtain a satisfactory end-point, and for some latices the method appeared to be altogether unsuitable.

It was found that when latex is stored, its stirring-stability in the presence of zinc-oxide shows a progressive fall during a period of five to six weeks and thereafter remains roughly constant. The type of container also appears to have an effect on the rate of change of stability during storage. In all the tests so far made, latex in glass containers showed a more rapid fall in stability than the same latex stored in closed iron or tinned-iron vessels. The effect of light has not yet been fully explored in this connection, but there are indications that it may accelerate the rate of fall of stability. The reasons for the fall of stability on storage are not yet known. Tests have indicated that the changes are not reflected in pronounced changes in viscosity, surface tension, or acetone extract of the total solids; the acid-value of the acetone extract does, however, tend to increase on storage.

A few preliminary tests gave indications that latex harvested during the wintering season shows a more pronounced fall in stability on storage than that harvested when refoliation is nearly complete. The sieving-stability apparatus developed by the Dunlop Rubber Co. provides a ready means for detecting the degree of incipient agglomeration which takes place in latex and which has a pronounced bearing on its stability during certain manufacturing processes. It was found that the pronounced storage changes which were indicated by the stirring-stability apparatus were not reflected in the results obtained by the sieving method.

VISCOSITY AND SURFACE TENSION. The striking increase in viscosity which takes place as concentration proceeds is well illustrated by the following typical table of values from a filtration experiment. The Höppler Viscometer was used for viscosity determinations.

D.R.C. %	η Centipoises
34.8	4.74
44.9	9.08
55.9	23.72
60.9	51.90
66.2	159.50
70.8	2,160.00

The rapid increase in viscosity which occurs at dry-rubber contents in excess of 60% has an important bearing on the design and operation of centrifugal machines for latex concentration.

Surface tension measurements with the Du Nüoy apparatus were made on a long series of mixtures of ammoniated latex with its own filtered serum and filtration concentrate. Such mixtures covered the dry-rubber content range from 0 to 70%. Over the range 0 to 62% the surface tension measurements were remarkably constant, between 43.7 and 44.9 dynes/cm. In the D.R.C. zone 66-70% the progressively higher values 47.3-64.4 dynes/cm. were ob-

[1] Abstracted from "Rubber Research Institute of Malaya, Annual Report, 1936," Aug., 1937.

tained, but these are open to question owing to the possibility of surface skimming during testing.

Preservation

Small trial lots of latex preserved with (a) 0.1% ammonia plus 0.3% sodium arsenite by weight on the latex, and (b) 0.1% ammonia plus 0.5% sodium arsenite were shipped to London for test purposes. The latex upon arrival had normal properties except in respect to stability which was found to be much higher than that of normal ammonia-preserved latex. However this practice is hazardous as the latex and articles produced from it might prove to be poisonous.

Paradichlorbenzene and benzoyl peroxide, when applied to fresh latex in amounts ranging from 0.05 to 0.5% by weight on the latex, both in the absence and presence of 0.1% ammonia, failed to preserve latex in a fluid condition. Attempts were made to sterilize and preserve latex by mild chlorination, but were unsuccessful. Ethylene diamine maintained fluidity of the latex for long periods, but its high cost would probably outweigh the advantage of the absence of a strong ammoniacal odor.

Concentration

CREAMING. Some success has attended the continued efforts to induce creaming by the use of substances other than vegetable or animal mucilages. One such substance has been found which gives high D.R.C. creams, but its cost, coupled with the necessity of employing it at high concentration, may render it uneconomical. A large number of methylated starches and hemicellulose products were tested for creaming freshly preserved latex. Unfortunately the majority proved to be less efficient than Tragon A, which was taken as a basis for reference.

CENTRIFUGING. It was sought to develop a process which would, while providing a satisfactory concentrate, yield at the same time a skim latex from which the rubber could be removed with greater ease than is the case with skim latices from ammonia-treated latex. No great measure of success was achieved; in most cases, where a readily manipulated skim resulted, trouble was experienced through rapid choking of the machine. Treatments which did not result in choking usually gave skim fractions which did not coagulate with the ease that was desired.

Two special samples of concentrated latex consisted of (a) ordinary centrifuged cream and (b) centrifuged concentrate prepared from the skim fraction. Micro-photographs indicated a preponderance of large particles in the cream and small particles in the concentrate from the skim. There was no complete separation of large and small particles in either latex, and it was considered that the concentrate from the skim would not have any enhanced practical value, as, for example, in proofing.

EVAPORATION. It has been found possible to concentrate ammoniated latex to a dry-rubber content of the order of 68% without the aid of added protective colloids.

FILTRATION. Concentrates have been prepared in porous earthenware vessels from normal ammoniated latex and also from creamed latex. Filtration was slow with frequent and thorough stirring necessary. It was found possible to reach a dry-rubber content of 70% by this means. An interesting comparison was made between high D.R.C. concentrates prepared from the same creamed latex by filtration and by evaporation. The final concentrates both contained approximately 68% dry rubber, but the filtered cream was much less viscous than its evaporated counterpart. The stirring-stability of the evaporated cream was found, however, to be much superior to that of the filtration concentrate.

Copper in Fresh Latex

Attention has been drawn to the fact that fresh latex has a small, but definite natural copper content. This was an unexpected finding which will receive further attention.

Preparation of Modified Rubbers

Favorable reports were received on rubber of low water absorption which was prepared by enzymic digestion. This was carried out by digestion with papain during storage of latex in an alkaline condition, followed by coagulation and soaking, before milling into crepe. The process of preparing this special rubber is troublesome, and it is considered important that the research be continued with the object of discovering a simpler procedure. Crepe rubber of this type possesses the undesirable features of being very slow drying and very sensitive to sunlight. Light has the effect of causing extreme stickiness.

Rubber in Compression[1]

In a method for coating metal with rubber in compression, described in British patent No. 434,191, rubber is vulcanized to sheet metal, and, after vulcanizing, the plate is bent to relieve the rubber of tension and to put the coating into a state of superficial compression. The patent relates to the linings of drums, cylinders, chutes, etc. The method was applied to ball mill linings as used in the cement industry for wet grinding, and tests indicated that these rubber linings did not equal, in respect to abrasion and cutting resistance, regularly used steel linings.

However the linings did prove to be vastly superior (five times the life) to rubber linings applied by ordinary methods. It is believed, therefore, that the methods employed can be usefully applied where it is desirable to use rubber linings and where abrasion and cutting resistance are important factors. The Rubber Growers' Association, the patentee, decided to release all claims to the patent so that other organizations can utilize the process.

[1] Abstracted from an article by Colin Macbeth, *Bull. Rubber Growers' Assocn.*, Jan., 1938, pp. 15-16.

Koroseal

(*Continued from page* 42)

R. Radio condenser insulation; receivers (acid); rods; rollers.

S. Sail covers; sealing members; sheeting; sport clothing; stethoscope and surgical tubing.

T. Tank linings for severe corrosive service; tarpaulins; textile roll coverings for spinning and card rooms; and temple rolls.

U. Umbrellas; unions and union gaskets.

V. Valve parts—disks and seals.

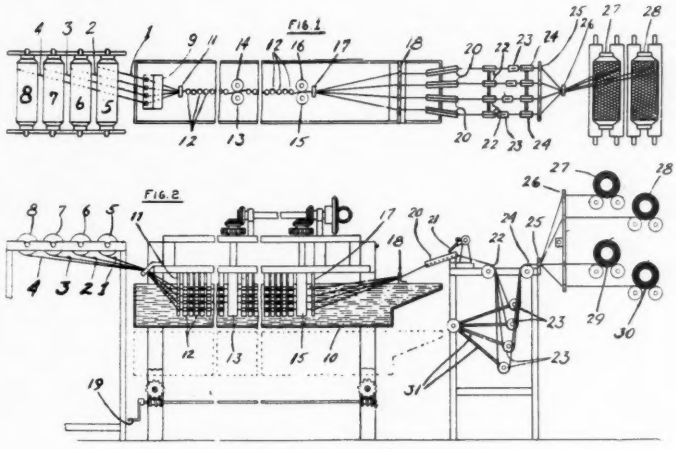
W. Waterproofing; weather stripping; wire insulation, electrical.

The ease with which compounds of varying hardnesses and varying compositions are produced together with the adaptability to standard processing operations has contributed to the usefulness of Koroseal in an increasing number of commercial applications. Its combination of unique properties has made Koroseal an indispensable commodity in many industries.

Latex Patent Abstracts

THE following patent embodies a machine which performs a continuous process whereby a plurality of cotton or other cords is passed around a vertical guide-roll mechanism which is immersed in a latex tank capable of being raised or lowered to regulate the latex level on the guide-rolls. (Editor's Note.)

Machine for Latexing Cords[1]



Apparatus for Latexing Cords

This apparatus thoroughly impregnates and coats with latex heavy cords such as those being used for the neutral axis portions of rubber belts. In the construction of this apparatus provision is made: to prevent the latex from coming into contact with the working parts; to maintain the cord under slight and even tension while passing through the latex; and to shut off the machine automatically in the event of a snarl or tangle.

Figure 1 is a diagrammatic plan view, and Figure 2 a diagrammatic side elevation of the apparatus, showing the main elements involved in its operation.

The cords 1, 2, 3, and 4 pass from the spools 5, 6, 7, and 8 through the apertures of the plate 9 into the latex solution in the tank 10, thence through the apertures of the cord guide plate 11. From the latter the cords thread their way in and out between the rollers 12, having grooves to space the cords, on their way passing between the squeeze rolls 13, 14, 15, and 16. While passing around the rollers, the cord is alternately flexed in opposite directions, since the direction of rotation is reversed between rollers by the arrangement of the gearing. Thus the twist is opened up, permitting the latex solution to penetrate through the innermost fibers of the cord. The squeezing and wringing action of the squeeze rolls further facilitates the thorough soaking of the cord. Since all of the rollers and the squeeze rolls are driven so that the peripheral speeds of all are the same, the cord is carried through the solution under very little tension.

The cords emerge from the squeeze rolls 15 and 16 and then pass through the apertures of the cord guide plate 17, thence upward through the apertures of the plate 18 above the latex solution. The level of the latter may be adjusted by rotating the hand crank 19 which moves the latex tank up or down with respect to the cord guide rolls and impregnating mechanism.

The cords then pass through the drying troughs 20 where their external surfaces are dried with air directed thereon from the drying pipes 21. The cords then pass over the guide pulleys 22, around the floating pulleys 23, over the guide pulleys, 24, through the apertures of the plate 25, thence through the apertures in the guide arm 26, and thence on to their respective spools 27 to 30 inclusive. During this travel of the cords as described above, the tension of the cord is regulated by the floating arms 31 in conjunction with mercury switches. The machine is protected by a mercury limit switch in case any of the cords become tangled or for any reason are not wound on their spools.

The cords, which originally have a loose fuzzy construction, assume a tightly wound and smooth appearance after the impregnating and drying process.

Extruding Rubber Dispersions[2]

In the manufacture of products such as rubber thread and tubing by the extrusion of heat-sensitized latex through heated nozzles, certain difficulties are encountered. This patent embodies process improvements intended to eliminate these difficulties and increase the extrusion speed. (Editor's Note.)

Process Application

Certain substances such as salts of bivalent or trivalent bases, bisubstituted guanidines, and oxides of bivalent metals, when added to latex in the presence of ammonium salts, will produce a heat sensitive composition that will coagulate upon heating to temperatures below 100° C.[3] Thus rubber thread and tubing can be produced by a continuous process which consists of extruding such a heat-sensitized latex through a heated forming tube or nozzle which causes coagulation of the latex. The flowing of the latex into the nozzle and the continuous extrusion of the coagulated product are obtained by the application of pressure to the latex container connected with the nozzle. Rubber threads and rods of any desired shape and of an overall diameter over 15 mm. can be produced. Upon introducing a core into the nozzle, so that the latex will flow through an annular orifice, it is possible to obtain a range from small valve tubing to tire inner tubes. Thread and tubing made by this process have walls of even cross-section owing to the fact that the coagulum reproduces the exact internal shape of the nozzle itself and is sufficiently stiff to be collected and finished without undergoing any deformation.

Extrusion Lubricants

By the above method, however, the production speed is relatively slow. The present invention relates to the improvement of the process, increasing its efficiency so that

[1] U. S. patent No. 2,077,492, Apr. 20, 1937.
[2] U. S. patent No. 2,084,702, June 22, 1937.
[3] U. S. patent Nos. 1,750,540 and 1,811,695.

it will be adaptable to a broader industrial exploitation. An investigation has proved that the sliding of the coagulum through the nozzle with the low pressure applied (generally below one atmosphere) is possible because a small quantity of the serum separates from the coagulum and serves as a lubricant, thus reducing the friction between the coagulum and the nozzle. The lubricating capacity of the serum can be increased by the addition of appropriate materials such as alkaline soaps, saponin, glycerine, and glucose. This material to be added must be such as to have no effect on the other materials used for heat-sensitizing or as vulcanizing agents and fillers. Also, extended maturing or heating below the coagulation temperature will generally improve the extrusion characteristics of the sensitized dispersion.

Effect of Preheating

A very high friction, which greatly restrains the extrusion of the coagulum from the nozzles, is offered on the beginning of the heated section of the nozzle where the latex begins to coagulate. Through tests it has been ascertained that the latex contacting the walls of the nozzle is coagulated at that point; while an inner vein of liquid latex remains, which becomes gradually smaller as it approaches the outlet of the nozzle. This vein is not coagulated immediately because of the time required for the heat, to propagate through to the inside of the liquid mass. It is not known whether the friction is caused by the pressure, applied to the latex to produce the flowing, acting through the liquid vein to create radial pressure or by the lack of sufficient lubrication from the relatively small amount of coagulum present in that section. However the friction is greatly decreased when the latex comes to the heated part of the nozzle in such a condition that it can be coagulated practically throughout its mass, making the liquid inner vein as small as possible.

This result is obtained when the latex arrives at the nozzle heated to near the coagulation temperature, which is accomplished when the portion of the nozzle, which is heated to cause the coagulation, is preceded by a portion heated to a lower temperature.

Latex Sealing Compounds[4]

This patent reviews a basic patent on sealing compounds for glass and metal containers and includes features largely pertaining to water absorption and claimed to be improvements on the basic method. A presentation of the theory is given upon which the patented improvements are based. (Editor's Note.)

Improved latex sealing compounds for containers are claimed to be water resistant and to have a lower tendency to squeeze or extrude when the lid is applied under pressure. Moreover seals thus produced will not tear or scuff when used on screw-top glass containers.

Causes of Water Absorption

Rubber, when dissolved in benzol, produces an extremely viscous mass even at low concentrations of rubber. Consequently with high-speed machinery it is difficult to deposit enough rubber in the container covers. Untreated latex, on the other hand, contains ample rubber, but cannot be applied properly because of its high fluidity.

In a previous patent[5] a method was disclosed of increasing the viscosity of latex and also of imparting plasticity to the mixture. Thus, application through nozzles became practical, and the latex mix could be retained in the channels of the container ends before assembly. The viscosity increase was accomplished by adding a hydrophilic colloid such as glue, casein, and Karaya gum; while plasticity was promoted by inorganic colloidal substances such as talc, bentonite, and aluminum oxide. The difficulty with these materials is that they promote water absorption in the compound which leads to a softening of the gasket.

Theory for Remedy

Workers in the field of colloid chemistry have shown that the addition of an electrolyte to a hydrophilic colloid first promotes swelling (water absorption); then swelling diminishes until in many cases flocculation occurs. Flocculated colloids have lost their power of water absorption. In those cases where flocculation does not occur with increased ionic concentration, other changes take place which render the water absorption of the colloid so low as to be negligible. For example, with amphoteric colloids, particularly the proteins, relatively insoluble metallic salts are formed. However acidic electrolytes coagulate latex, and also it is the ability of a hydrophilic colloid to form a gel which makes it of value either as a viscosity or plasticity factor.

Effect of Zinc Ammonium Salts

The present patent provides for the addition of a substance which neither flocculates the colloids nor coagulates the latex until such flocculation or coagulation will do no harm. A double salt is utilized which dissociates into an effective electrolyte on increase of temperature or of concentration. Thus, in practice, the salt is dissociated by heating or drying the compound after application to the container end. In addition to having the ability of dissociation as described, the substance must also be nontoxic and compatible with the latex mixture used. The most effective substances having these qualifications are considered to be zinc-ammonium salts such as zinc-ammonium chloride and acetate.

Sealing compounds containing such a zinc salt may be used for providing water-resistant seals for conventional cans, skirted containers, and containers with screw caps.

[4] U. S. patent No. 2,079,320, May 4, 1937.
[5] U. S. patent No. 1,765,134, June 17, 1930.

Fiberglas

(*Continued from page* 38)

There are many products incorporating Fiberglas and rubber which are still in the development stage. One of the most important of these is in the line of beltings where Fiberglas fabrics and cords are being made into flat and V-type belts. Besides other belts are being made in which a standard belt is covered with a layer of Fiberglas loosely attached to its surface. These belts are intended for use wherever hot materials are being conveyed. By suitably regulating the thickness of the Fiberglas fabric it is possible to protect the conveyer and lengthen its life considerably.

For acid resistant and heat resistant gaskets preliminary tests on Fiberglas are quite interesting. Acid resistant gaskets for container closures have shown considerable promise. So far only one serious difficulty has been found with gaskets or packings containing Fiberglas. These materials should not be exposed to moving parts as the glass is very hard and abrasive and may cause considerable wear.

In the field of friction materials the abrasiveness of Fiberglas is not a detriment, but an asset. Considerable experimental work is being performed to develop brake bands, polishing cloths, and the like.

Distributers' Tire Stocks

In the United States, January 1, 1938[1]

THE results of the quarterly survey of retail stocks of automobile tires and inner tubes, as of January 1, 1938, are shown below in comparison with summary data for preceding surveys, the bases and methods described in previous reports having been used in calculating the stocks held by the following three groups of distributers: 1. Dealers holding over 100 casings each on April 1, 1937. 2. Distributers through oil-company chains and some independent filling stations. 3. Manufacturer-owned, mail-order house, and other large chains of retail stores.

Distributers' Stocks Indicated by Surveys

The following summary table, with comparative estimates of total stocks held by the three groups of distributers covered in these surveys, shows stocks of casings on January 1, 1938, slightly lower than on October 1, 1937; while stocks of inner tubes are lower by more than 2%.

Tax receipts from the federal excise tax on rubber tires were 3.6% heavier for the final quarter of 1937 than in the same quarter of 1936, and for inner tubes 1.7% heavier, possibly reflecting stimulation of sales to distributers in anticipation of the early December tire price increase. This survey indicates that shipments to distributers in that quarter were moved on to consumers.

	Thousands of Casings			
	Dealers	Oil Companies	Other	Total
1936				
April 1	2,321	1,543	1,890	5,754
October 1	2,179	1,757	2,110	6,046
1937				
April 1	2,465	1,853	2,304	6,622
July 1	2,161	1,996	2,299	6,456
October 1	1,929	1,774	2,289	5,992
1938				
January 1	1,938	2,115	1,920	5,973

	Thousands of Inner Tubes			
	Dealers	Oil Companies	Other	Total
1936				
April 1	3,000	2,040	1,902	6,942
October 1	2,710	2,097	2,228	7,035
1937				
April 1	3,155	2,019	2,170	7,344
July 1	2,602	1,960	2,129	6,691
October 1	2,268	1,957	2,038	6,263
1938				
January 1	2,280	2,127	1,717	6,124

Stocks of dealers holding less than 100 casings each are not included in these estimates; the number of tires held by such smaller dealers is estimated by trade statisticians to range between one million and one and a quarter million, at different seasons. The January 1 date would normally be a period of low stocks for small dealers.

Dealers Reported Stocks

The following table compares the stocks reported by 1,180 dealers for 1,478 stores in the current survey, with the stocks reported by the identical firms in the survey of October 1, 1937, when their stores numbered 1,523. These dealers are divided into three groups, those holding up to 200 casings each in stock show stocks reduced from October to January, those holding 200 to 499 casings show stocks about evenly maintained, and those holding 500 casings or more show increased stocks. The overall net change is a slight increase, the index number for dealers' total stocks of casings advancing from 85.7 on October 1, 1937, to 86.1 on January 1, 1938.

An additional group of 194 dealers who did not report last October, but did report July 1, 1937, when the index number for dealers' stocks of casings was 96.1, show January stocks reduced to 86.0, which is surprisingly close to the result shown by the October-January comparison, and lends support to the belief that the results of this sampling survey furnish a satisfactory indication of the trend of dealers' stocks as a whole.

A still further group of 60 dealers, who reported in the current survey, last reported April 1, 1937. Comparison with the April 1 index of 109.5 would show January 1 stocks of casings at 84.5 for this group, again a surprisingly close comparison of trend.

Number of Casings January 1	Number of Dealers	Number of Stores	October 1, 1937 Casings	October 1, 1937 Tubes	January 1, 1938 Casings	January 1, 1938 Tubes
Up to 200.....	733	848	89,563	116,074	79,219	110,383
200 to 499.....	310	388	93,512	117,497	93,293	110,560
500 and over....	137	242	175,735	201,248	187,914	205,761
Total	1,180	1,478	358,810	434,819	360,426	426,704
Other January 1 reporting last in:						
July, 1937	194	229	48,421	55,388	43,325	50,121
April, 1937	60	80	15,722	17,528	12,130	12,798
Plus late receipts	24	80	.....	.....	13,694	15,531
January 1 Totals	1,458	1,867			429,575	505,154
Index Numbers Derived.....			85.7	100.8	86.1	101.3

Mailing List Additions Solicited

The number of dealers reporting July 1, 1937, was 1,765 with 2,826 stores; 1,288 of these with 1,904 stores also reported April 1, 1937. The number of dealers reporting October 1, 1937, was 1,633 with 2,291 stores; 1,290 of these with 1,758 stores also reported July 1, 1937. The number of dealers reporting January 1, 1938, was 1,458 with 1,867 stores; 1,180 of these with 1,478 stores also reported October 1, 1937. The number of reports received (also the number of stores per dealer) has declined. The success of the survey depends on continuity of reports from identical firms, and we are highly appreciative of the cooperation of so many dealers. It will, however, be necessary to make additions to the mailing list so that enough comparative reports may continually be received to assure that the survey is representative.

We shall accordingly appreciate receiving lists of representative tire dealers, or members of State and Local Tire Dealer Associations, from any firms who receive this circular, particularly lists of dealers holding stocks of 100 casings or more at seasonal peaks, for addition to our mailing list.

[1] Special Circular No. 3,664, Rubber Section, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C. Rubber Industry Letter No. 28.

Oil Company Distributers' Reported Stocks

Reports were received from 43 firms distributing tires through chains of filling stations and sometimes also through independent stations. Of these firms 36 reported data both for October 1 and January 1, but in order to prevent possible disclosure, only totals are reported below for January in comparison with October. Comparison of data reported by identical firms in January and October yields index numbers for January shown in the table. A considerable increase in stocks of casings and inner tubes held by these distributers is indicated by the index numbers for the final quarter of 1937.

	Reported Stocks	
	October 1	January 1
Number of firms	42	43
Casings	1,112,344	1,166,471
Inner tubes	1,227,930	1,173,982
Index Numbers:		
Casings	107.5	128.1
Inner tubes	118.6	128.9

Other Mass Distributers' Reported Stocks

Reports were received from six tire manufacturing companies covering stocks held in company operated retail outlets, and from six other mass distributers covering their total stocks on hand as of January 1. Stocks reported here by manufacturers are presumably also included in manufacturers' inventory as reported by The Rubber Manufacturers' Association, Inc.; such stocks cannot be separately shown here without possible disclosure of confidential information. The number of stores reported by tire manufacturers for October was 1,945; other firms 1,815. Reported stocks of both casings and inner tubes were sharply reduced by this group of distributers.

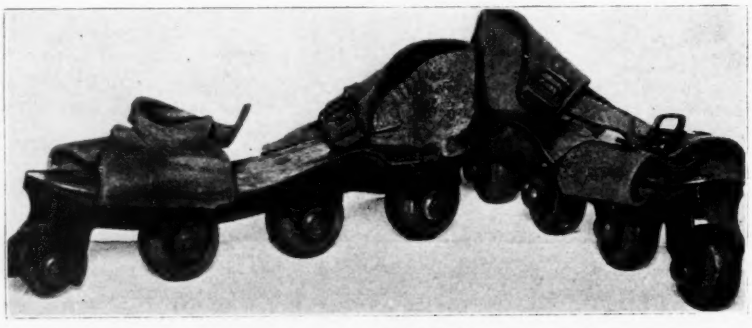
	Reported by Identical Firms	
	October 1	January 1
Number of firms	12	12
Number of stores	3,758	3,760
Casings	2,274,575	1,910,483
Inner tubes	2,029,335	1,709,092
Index Numbers:		
Casings	114.4	96.0
Inner tubes	101.9	85.9

Acknowledgment

The support of The Rubber Manufacturers' Association, Inc., the assistance of the National Association of Independent Tire Dealers, and the cooperation and promptness of dealers, oil company distributers, manufacturers and other mass distributers, in submitting data used in this report, is gratefully acknowledged.

Primitive Rubber-Tired Skates

BACK in 1879, A. A. Benedict, of 287 Broadway, New York, N. Y., was given a pair of rubber-tired, four-wheel-in-line skates by his uncle, Pete Hotaling, one-time famous baseball player of the Syracuse, Brooklyn, and Cleveland clubs, who is known to have purchased the skates years before, but regarding which definite dates are not available. The antiquity of these skates is indicated by the words "Goodyear's Patent 1844-58" which are still readable as having been imprinted on the side of each tire, and it is reasonable to assume that these roller skates were made during that patent period. Originally of soft rubber, the tires, through the long period, have become as hard as ebonite.



Skates with Rollers to Which Are Attached Rubber Tires under Goodyear's Patent of 1844-58

Around the outer periphery of one of the rubber wheels there is, after many years, evidence of a mold seam, indicating that the rubber was vulcanized to the iron wheels in half molds, meeting at the middle of the wheel face. An extremely strong bond must have been made as only one wheel now shows evidence of the rubber separating from the iron, and, as shown in the accompanying photograph, the rubber tire, of which about three-quarters remain, has been removed, but a coating of rubber still clings to the metal.

The hand-made skates indicate great skill in metal working as the construction is rigid, the joints well formed, and the buckles smoothly finished. The leather straps are known to have been attached prior to 1879. The skates have been used very little since Mr. Benedict received them, but the worn portions of the leather indicate many years of service befor that time, particularly as roller skating was confined to the occasional skating parties permitted on dance floors. From the above evidence, it is believed that these skates represent the earliest known instance of the vulcanization of rubber to metal wheels and possibly to metal for any use.

PROFIT SHARING PLANS. Renewed interest in profit-sharing plans is indicated by a survey by the National Industrial Conference Board. Out of 50 active formal plans 18 began during the last recovery period. Analysis of these plans shows wide variation in methods determining the share of profits allotted for distribution and the amounts given each employe. Distribution is annual by 21 companies and at other and more frequent intervals by the remaining 29. The board found also that 96 companies had abandoned profit sharing, usually because of unfavorable employe reaction. Plans under which extra compensation is paid employes, but which do not represent profit sharing, since the compensation is not related directly to company earnings, were reported by 32 concerns. Companies having active profit-sharing or other extra-compensation plans have 207,815 employes.

Underwood & Underwood Studios

Harvey S. Firestone

1868 - 1938

SINCE the inception of his business career in 1888 at the age of twenty, Harvey S. Firestone continuously displayed a combination of rare qualities comprising a considerate thoughtfulness for his associates, a remarkable forward vision as to the possibilities of attaining an accepted goal, and an indomitable will to forge ahead to the attainment of that aim.

In addition to his many outside interests and activities Mr. Firestone lived to see, within a span of forty-one years, his life work, the manufacture of rubber goods, grow from a company of ten employes producing twelve buggy tires per day to a group of companies giving work to fifteen thousand employes and having a capacity of fifty thousand tires per day, which together with other rubber products resulted in total sales of one hundred fifty-six million dollars for the year ending October, 1937.

Throughout this great success Harvey Firestone retained his simplicity and sincere regard for those with whom he came in contact. The rubber industry and his friends have benefited from his inspirational influence and will bear in memory a great leader.

EDWARD LYMAN BILL
PUBLISHER

Editorials

Value of Experience

DID you ever observe an experienced and seasoned operator at his work? Did you note the absence of confusion and inefficient motion in connection with his preparation and completion of the work at hand? Did you see that the finished product was a quality article which represented the objective attained by direct and effective methods without the appearance of haste, yet completed within a reasonable length of time?

Because of the experience gained during years of attentive work, this workman knew how to make his efforts effective: not only did he know what to do, but also he knew what he should not do. Except in unusual cases where the operator is endowed with rare judgment, can these results be obtained other than by the use of knowledge gained by experience.

These observations will be found to be true in the case of the producing operator, the foreman, the clerk, the manager, or the technician. Deliberate, planned activity is invariably fostered by the knowledge gained through observance of results obtained over a considerable period of time. It is true that some persons are so constituted that they do not appear to have gained by their experience, but this condition is one of mental attitude rather than that of not having learned.

The late Dr. R. S. Woodward, when president of the Carnegie Institution, once said that a third of the years of a professional man's life have usually passed by the time he has finished his formal schooling; then another third are spent in developing his capacities through practice and in proving to himself and to others what his capacities really are, before he wins his fullest opportunity for service; and so only a third of his years remain in which to render his best services to the world.

Professor Henry Sherman recently pointed out the fact that most scientists reach the peak of their achievements around the age of fifty, and he presented charts resulting from many weeks of investigation which did not show any abrupt decline from the maximum. Professor Sherman also showed how through chemistry and medicine the period of the prime of life is being extended in both directions.

Is it not a legitimate corollary that experience is equally important in the conducting of a modern business? Is it not good practice to coordinate the potentialities of youth with the knowledge and mature judgment made possible by long periods of practical experience? The recent trend has been toward industrial disqualification of men in the last third of their normal life expectancy. Is it not expedient from a selfish motive to take inventory of the available experience and utilize it to the fullest extent and thus avoid the errors of inexperience?

Business Men Speak

RECOGNIZED opportunity has been given to business men for expression as to conditions regarded by them as influencing the existing national economic illness, and a request was made for a prescription from those of whom a portion has been considered by some as having been associated with the propagation of the ailment. The conferees were divided into two groups, one of which has on several occasions been portrayed as the depressing factor and the other as among the victims.

With a guarded dignity the former, representatives of large business concerns, voiced their honest opinions as to some of the causes and possible remedies. The latter group, indicative of smaller companies doing business, presented quite essentially the same views in a less restrained manner. No great surprise should be caused by this unity of thought as both groups are intimately associated with industry and commerce, which constitute the foundation of national economic structure. Their problems are necessarily of the same nature, differing only in degree.

The effects of decreasing business are of such importance to both groups as to render unquestionable their sincere desire for sound, prosperous business conditions. The fact that the views of both types of business men are largely the same should be evidence of their basic soundness and should indicate the importance of concerted group expression. Those who through their everyday activities are continually analyzing business conditions should be best qualified to give advice toward remedial measures.

A wide cross-sectional representation of American business men can be helpful in formulating a constructive program intended to promote peaceful cooperation of business, labor, and government. The movement recently started is worthy of continued efforts in emphasizing the need of applying practical economic principles.

In order to obtain the greatest effectiveness from these efforts a sincerely conceived plan outlined by representative committees might then be submitted for approval or revision by the individuals associated with production and exchange. Lists of signatories to the resolutions presented to the legislators would be impressive as to the solidarity of thought by those who not only are on the firing line, but also are accustomed to operate on a balanced financial basis.

EDITOR

What the Rubber Chemists Are Doing

A. C. S. Rubber Division Activities

Boston Group

ON FEBRUARY 4, the Boston Group, Rubber Division, A.C.S., held its first meeting of the year at the Fox & Hounds Club, 448 Beacon St., Boston, Mass., at which a very enjoyable lobster dinner was served to 140 enthusiastic members and guests.

In accordance with plans for 1938 the program consisted of three short talks of a non-technical nature, but of definite interest to those present, both chemist and non-chemist.

In discussing "New Developments in the Manufacture of Rubber Cements," Roland D. Earle, of Angier & Earle, Inc., stated that latex cements and solvent cements have struck a balance for use under different conditions. Latex cements are applicable only where drying is possible before adhesion between two layers is required, and solvent cements are the only type that can be used where it is necessary to contact the two surfaces immediately and rely upon subsequent drying. He emphasized the importance of the more recently developed naphthas which dry as fast as benzol through which it has been possible to replace benzol cements for shoe factory use. Mr. Earle pointed out the need of a cheap, non-inflammable, non-toxic solvent for use in making cements.

The next speaker, Jesse H. Mason, of Haartz-Mason-Grower Co., on the subject "Rubber Proofing," reviewed the conditions 25 years ago as compared with the present. He deplored the lack of advancement in methods and equipment, stating that the mechanical methods are essentially the same except for the adoption of the Banbury mixer and larger mills. The same churns and spreaders have remained in use. In contrast Mr. Mason cited the improvement in calendering and vulcanizing methods through the use of thermo static control as well as motor lifts for calender rolls and electrolytic thickness gages. He noted the improved methods employed now over those in use 25 years ago in connection with the sulphur chloride curing process. Also great advancement has resulted in the present availability of more and better accelerators, colors, and bright-finish coatings.

Robert C. Kelley, purchasing agent for the Converse Rubber Co., chose as his subject "As a Buyer Looks at the Rubber Market." Mr. Kelley discussed the relations of the buyer and the salesman and pointed out the many ramifications of rubber procurement on both the spot and futures markets.

Numbers were distributed to those present and as a result of the drawing, W. D. Egleston, of the Wm. D. Egleston Co., won the door prize, an Eastman movie camera. Contributers toward this splendid prize were The Barrett Co., E. I. du Pont de Nemours & Co., Inc., W. D. Egleston Co., Harold Fuller, Ernest Jacoby & Co., Krebs Pigment & Color Corp., D. H. Litter Co., H. Muehlstein & Co., Inc., Naugatuck Chemical, R. T. Vanderbilt Co., L. G. Whittemore Co., and The New Jersey Zinc Co.

Los Angeles Group

THE February meeting of the Los Angeles Rubber Group, A.C.S., was held on February 1 at the Mayfair Hotel, Los Angeles, Calif., with 128 members and guests present, the largest attendance on record. The entire program was presented by the Goodyear Tire & Rubber Co., arrangements having been made by W. H. Fleming, general superintendent of Goodyear.

Mr. Fleming introduced the first speaker, B. Darrow, who discussed "Tire Development and Tire Design." In this brief and interesting talk Mr. Darrow reviewed accomplishments in tire design with particular reference to the following: tractor tires, Life Saver tubes, and the use of rayon in tires. The speaker also presented a survey of the factors affecting tire wear.

The next speaker, R. P. Gaylord, whose subject was "Tractor Tire Tests," stated that 50 to 55% of the tractors now produced are equipped with rubber tires when leaving the factory. Details of tests made on various sizes and types of tires under a wide range of road and field conditions were given by Mr. Gaylord.

Capt. Art Sewell, pilot of the Goodyear airship *Volunteer*, showed a motion picture, "Air Fleet," which depicted some of the unusual stunts performed by various Goodyear airships. The better service to be secured by lighter-than-air ships in transoceanic flights through night flying was stressed by Captain Sewell.

Door prizes, which consisted of three sets of two tickets each for rides on the Goodyear blimp, were won by: C. A. Neville, L. E. Bencher, and W. Michalek. The raffle prizes were single tickets for blimp rides and were won by: Messrs. Benson, Woerner, Newell, and Royal. Both door and raffle prizes were donated by the Goodyear Tire & Rubber Co. Cigars were presented to all those present with the compliments of the H. M. Royal Co.

Garvin Drew, of the program committee, announced that G. J. Burger, of the National Association of Independent Tire Dealers, would speak at the March 1 meeting. Other probable speakers and subjects are B. Heer on molds and Mr. Kincaid on camelback. The April meeting is to be another major tire company night, and the May meeting will be an aviation night.

Akron Group

WITH 250 members and guests in attendance, the Akron Group, Rubber Division, A.C.S., held its winter meeting on February 18 at the Akron City Club. After the sea food dinner, Dr. Webster N. Jones, director of Engineering College, Carnegie Institute of Technology, introduced the speaker of the evening, S. D. Kirkpatrick, editor of *Chemical and Metallurgical Engineering*.

Mr. Kirkpatrick, in speaking on the subject "Chemical Engineering Comes of Age," pointed out that the chemical industry has its roots in the six fundamental human needs: food, shelter, clothing, health, security, and transportation. According to the speaker, modern chemical engineering in this country began with America's entrance into the World War 21 years ago. However it was 50 years ago when the Massachusetts Institute of Technology offered the first course in chemical engineering. Progress was slow as the early chemical engineers' training was usually deficient in either chemistry or engineering, proficiency being limited to one or the other.

After discussing the vast expansion of the chemical engineering industry, Mr. Kirkpatrick exhibited a large number of interesting modern products of this industry, which included: plastics, safety glass, glass yarn, the newer textile chemicals, and many of the textiles themselves.

The speaker closed his informative discussion with a quotation from the late Arthur D. Little: "Industries age like human beings. They have the haz-

ards and diseases of childhood, the capacity for development in vigorous youth, the stability and strength of maturity, and the conservatism and atrophy of age. The railroads are old, the automobile is approaching middle age, but our chemical industries are still in their energetic and elastic youth—with their great achievement still before them. Chemistry is a creative science and the first Chapter of its Book of Genesis is not yet written."

Chicago Group

THE Chicago Group, Rubber Division, A.C.S., held its first meeting of 1938 at the Sherman Hotel, Chicago, Ill., on February 18. With the Chicago Section of the American Institute of Chemical Engineers as guests of the Group, the meeting had an attendance of over 225 men. Following the dinner and floor show in the College Inn of the hotel, Dr. C. E. Frick, introduced William Welch, president of the Midwest Rubber Reclaiming Co., East St. Louis, Ill.

Mr. Welch presented the motion picture production, "Rubber Reborn," which was taken in its entirety at the plant of the Midwest Rubber Reclaiming Co. The production, which showed in great detail every phase of the manufacture of reclaimed rubber, started with old tires being unloaded from freight cars, which step was followed by each successive operation in the processing to the finished reclaim. The excellent photography of the picture, unusual in an educational film of this kind, and the informative character of the picture won the unanimous acclaim of all those present.

The next meeting of the Chicago Group will be held some time in April.

New York Group

THE New York Group, Rubber Division, A.C.S., will hold its spring meeting on Friday, April 8, at the Building Trades Employers' Association club rooms at Two Park Ave., New York, N. Y. An excellent program has been arranged.

Dr. Ernst A. Hauser, of Massachusetts Institute of Technology, will speak on "Structural Ideas on the Vulcanization of Rubber and Like Substances." The address will be based on work done during the past year by the speaker and John R. Brown. The discussion of this subject, which is of the deepest significance to those in the rubber industry, should prove most interesting. A second speaker, H. Walter Grote, of the United Carbon Co., will give a short technical discussion followed by some of his inimitable feats of deception.

The dinner is scheduled for 6:30 p.m. Reservations should be sent to the Group Secretary, Peter P. Pinto, 250 West 57th St., New York, N. Y.

At five o'clock, just prior to the meeting, the Executive Committee will meet to discuss plans for the outing and activities for the remainder of the year.

Rubber Division-Detroit Meeting March 28 and 29

IN ACCORDANCE with a decision at the Rochester meeting last fall, the spring meeting of the Rubber Division, A.C.S., will be held at the Book-Cadillac Hotel, Detroit, Mich., on March 28 and 29. This meeting is independent of the general American Chemical Society meeting which is to be held in Dallas, Tex. Owing to the fact that the deadline for receiving papers was February 21, the definite program cannot now be announced. However plans are being made for a very interesting and instructive meeting. Because of the expanding use of rubber in automobile construction, this gathering in the center of the Automotive Industry should afford an opportunity for discussions relating to this important outlet for rubber.

Those planning to attend should make reservations in Detroit hotels in advance.

London Rubber Conference Arrangements

MAY 23, 24, and 25 are the dates on which the Rubber Technology Conference will be held in London, England, under the auspices of the Institution of the Rubber Industry. While program details are not yet available other than as published in the November and December issues of INDIA RUBBER WORLD, indications point to an instructive well-attended meeting. A number of American rubber chemists have signified their intentions to present papers, and many others expect to attend the sessions.

For the benefit of those who plan on attending, the A.C.S. Committee on Arrangements has obtained the following relevant information.

The *S.S. Britannic* will sail from New York at 12:00 noon on Saturday, May 14, and proceed by way of Boston, arriving in Southampton, England, on Sunday, May 22, the day before the conference starts. The *S.S. Champlain* sails Thursday, May 12, arriving in Plymouth on May 19. The *Bremen* sails on May 10, and the *Queen Mary* on May 11. One way fare on the *Britannic* is $124 and on the *Champlain* $127.

Headquarters for the conference will be in the Victoria Hotel on Northumberland Ave., which leads off Trafalgar Square. Entire proceedings will be held in the Victoria Hotel, which has a lecture hall seating 300 people in which microphones will be installed. W. F. V. Cox, secretary of the I.R.I., reports the Victoria Hotel as definitely first class and extremely comfortable. Prices for accommodations at the Victoria are: 14/6d. for bed and breakfast including the use of public bathroom. For rooms with private bath there is an additional charge of 5/6d. per person for double rooms and 7/- for single rooms.

Questions regarding further arrangements will be promptly answered by the Committee, which consists of A. A. Somerville, R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y.; Wm. B. Wiegand, Columbian Carbon Co., 41 E. 42nd St., New York, N. Y.; and John M. Bierer, Boston Woven Hose & Rubber Co., Cambridge, Mass.

Rhode Island Rubber Club

THE next meeting of the Rhode Island Rubber Club will be held on Friday, March 4, at the Narragansett Hotel, Providence, R. I. An excellent program has been arranged for the evening.

The technical speaker on the program, H. R. Moulton, executive secretary of research, American Optical Co., has chosen as his subject "Polarized Light and Its Applications." Mr. Moulton will review the development of polarized light from the earlier crude experiments of the fifteenth century to the present use of the new sheet polarizing material. Illustrations indicating the use of polarized light will include strain analysis of engineering structures, patterns produced by crystals in polarized light, usefulness of polarized light in illumination of art museums, industrial inspection, and automobile headlights. In conclusion the speaker will give a demonstration of stereoscopic or three-dimensional colored motion pictures.

Speaking on "These Troubled Days," E. I. Kilcup, president, Davol Rubber Co., will deal with the business rather than the technical side of rubber manufacture.

As an added attraction, the Davol Rubber Co. Glee Club under the direction of C. F. Nicholas, will entertain with musical selections. The glee club, composed of 24 members from all parts of the Davol factory, is somewhat unique in the rubber industry. Frequently requested to entertain at monthly meetings of the Davol Foremen's Association, the glee club has also appeared before outside organizations and has been the recipient of very complimentary comments.

Caulking Compound[1]

For caulking crevices which are exposed to severe vibration, the use of rubber has been found helpful as exemplified by the following formula:

Rubber (White Crepe)	15
Rosin	10
Naphtha (Petroleum)	25
Wood Flour	50

It is obvious that after evaporation of the solvent a layer of wood flour bound by rubber and rosin remains. This is very flexible, but tacky, and any exposed portions should have a protective coating of varnish or lacquer to prevent the troubles of collecting dust, etc.

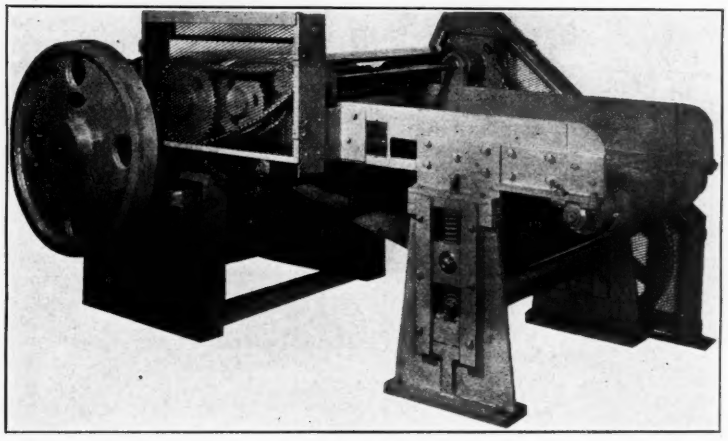
[1] Abstracted from "Wood Fillers" by C. F. Mason, *Chem. Ind.*, Sept., 1937, p. 267.

New Machines and Appliances

"Giant" Tire Chopper

FOR chopping up automobile tires after debeading, the No. 34 "Giant" tire chopper, said to be the largest machine of its kind, has a capacity of 20 tons per hour, but requires only a 50 h.p. drive. Tires are thrown on the apron and are carried smoothly into the nip of the feed rolls, pressed against the revolving knife cylinder, and cleanly cut into strips. Heretofore, when tires were cut up for rubber reclaiming, it was necessary to fold each tire before feeding, but with the large 36-inch throat of this machine, folding is unnecessary.

The cutter weighs 11,000 pounds, occupies a floor space of only seven by nine feet, and has a speed of 750 r.p.m. There are four 36-inch revolving knives and one bed knife. The frame is of steel welded construction; while the knife cylinder head is of cast-iron with wearing surfaces stellited. The cast-steel feed rolls are fluted and notched. Taylor, Stiles & Co., Riegelsville, N. J.



Tire Cutting Machine

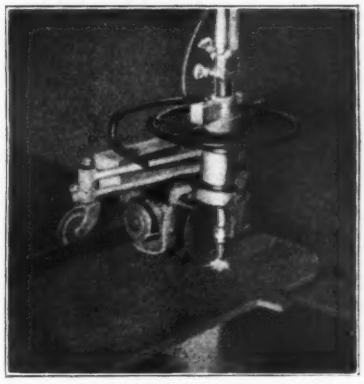
Wide-Range Molding Presses

STANDARD self-contained molding presses are adaptable, through simple adjustment, to a wide range of pressures. The presses, made in 50-, 100-, 150-, and 300-ton sizes, have the following platen dimensions, 12 inches by 20 inches, 23 by 27 inches, 23 by 27 inches, and 40 by 28 inches, respectively. A motor drives a two-stage pump; the pressure on the low-pressure pump is adjustable and is usually operated at 150 to 225 pounds per square inch; the high pressure pump is also adjustable up to a maximum of 1,000 pounds per square inch. In the center of the base of the presses is a hydraulic cylinder operated by the pump pressure. The cylinder ram is connected by means of links to the toggles, the links acting as a third toggle straightening out the other two toggles as the ram is pushed up. As the toggles are straightened, the platen is forced up, closing the molds. The press is controlled by a single lever on a four-way valve, on the right-hand side of the machine.

The platen is raised under low pressure until the pressure exerted in the cylinder is equal to the pressure for which the low-pressure pump is set. Then the low-pressure pump automatically cuts out, and the high-pressure up until it reaches the point at which the high-pressure pump is set. A by-pass relief valve maintains constant pressure as long as desired. Upon opening, the molded pieces are ejected by an automatic system.

By either of two simple adjustments, requiring only a few seconds to make, it is possible to reduce the total rated capacity of a Standard press to any desired point down to approximately one-third of its standard rating. The capacity reduction is made by either adjusting the high-pressure pump release valve or lowering the position of the "thrust" block. This versatility is of advantage where diversified work requires a wide range of pressures.

As these presses open and close quickly with automatic pressure changes at the proper time, they allow for increased production. Standard presses can be used for cutting odd shaped pieces from rubber stock as well as for molding a wide variety of rubber goods. The Standard Machinery Co.

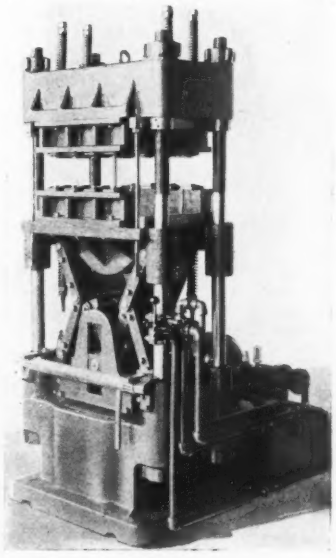


Oxweld Cutting Machine

Portable Cutting Machine

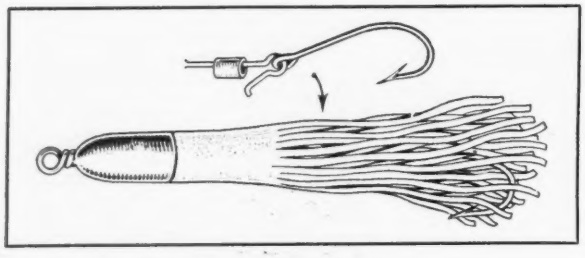
THE Oxweld Type CM-16 portable cutting machine has been designed to meet a need of a small machine for oxy-acetylene cutting in steel fabrication work. Any practical shape can be cut out of steel plate up to four inches in thickness. Hand steering is used for irregular shapes; while, with the use of the track furnished with the machine, it can make a straight line cut.

The machine weighs only 45 pounds and has a speed range of four to 30 inches per minute. Without the use of the track it can be operated for cutting irregular shapes conveniently on a plate area as small as 14 inches square. The Linde Air Products Co.



Standard Molding Press

New Goods and Specialties



Rubalure, a Fishing Lure with Rubber Strands to Hide the Hook. The Metalure Co.

Rubber Bladed Fan [1]

A PATENT has been granted for a rubber bladed fan which eliminates the undesirable characteristics of noise and possibility of injury present in its metal predecessor, the design of which has not changed appreciably since its origin in 1886. The new fans, which have been proved many times quieter, dispel the theory that it is impossible to move air as readily with soft flexible blades as with hard unyielding blades.

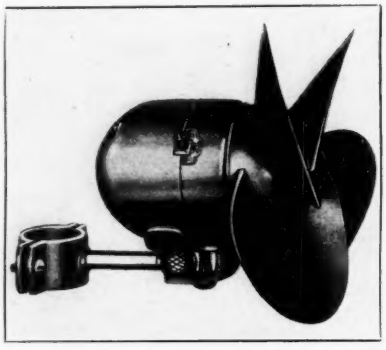
Through their safety, silence, and improved appearance, rubber bladed fans have established their practicability for home and commercial use. Further applications have included telephone booth and automobile use. A number of accessory manufacturers have taken licenses under the rubber bladed fan patent. Samson-United Corp.

[1] U. S. patent No. 2,095,223, Oct. 5, 1937.

Corded Shoe Sole

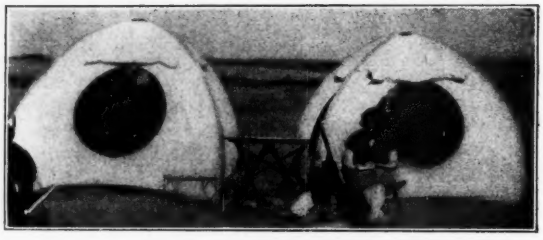
CROSS-LAMINATED in construction, Goodyear's new flat corded sole has the cord on the wearing surface laid cross-wise; while the cord on the attachable surface is laid lengthwise. This construction is said to result in even flexibility and greater tensile strength. The sole lies flat instead of having a tendency to curl as is the case with cord-on-end construction. The Goodyear Tire & Rubber Co.

Goodyear Corded Sole



Safe-flex Rubber Autofan

Sheerine Raincape



Igloo Tents

Pneumatic Tent

A NEW type of tent, called the "750" Igloo, requires no poles and can be erected in three minutes. The body of the tent is made of waterproof fabric, and the ribs or supports are of special canvas tubing inside of which pneumatic tubes are fitted. These tubes are connected at the top, and inflation is accomplished through a valve at the base of one of the tubes. The tent is fitted with a special "Igloo" door and windows which open and shut from the inside. The base of the tent is seven by seven feet, and the height is six feet. When packed, the tent weighs 22 pounds and can be carried in a comparatively small valise. Pneumatic Tent Co., Ltd.

Lightweight Raincapes

RAINCAPES, recently introduced, are made of Sheerine, which is described as a new waterproof material containing rubber. This material, as the name implies, is sheer with a veiled transparency. The raincapes, light in weight and flexible, drape well when in use and can be folded compactly for carrying in the pocket. They are unhemmed and therefore can be shortened by cutting to the desired length. Sheerine capes, made in four colors, weigh 6½ to 12 pounds per dozen, depending on the size and type. The Seamless Rubber Co.

Burst-Proof Steam Hose

ILLUSTRATED is a recently announced burst-proof steam hose. *A* is a heat-resistant rubber tube; *C* and *E* are rubber insulating layers; *B* and *D* are braided steel wire reenforcements; *F* is a braided asbestos cord; and *G* is a rubber cover. The B. F. Goodrich Co., Akron, O.

New Goodrich Hose

Rubber Industry in America

OBITUARY

H. S. Firestone, Sr.

HARVEY FIRESTONE is dead. The end came suddenly, painlessly, on February 7 while the rubber magnate was asleep at his winter home in Miami Beach, Fla.

His first job, in 1888, was as bookkeeper for a coal dealer in Columbus. Next, in 1892, he became a traveling salesman for a patent medicine concern. Two years later he joined the Columbus Buggy Co., becoming company representative in Detroit, Mich. The manufacture of rubber tires for carriages intrigued him; so in 1896 Mr. Firestone organized the Victor Tire Co. in Chicago. That same year in the same city he started the Firestone Rubber Tire Co. Then he bought the Imperial Rubber Tire Co., Chicago, and merged it with the Rubber Tire Wheel Co., Springfield. Later this business was merged with the Consolidated Rubber Tire Co., New York, and in 1899 Mr. Firestone was serving as general manager.

The noted industrialist first met Henry Ford in 1894, when the latter was seeking some kind of a vehicle to be powered by his gasoline motor. Mr. Firestone helped devise a chassis. The rubber manufacturer was also credited with driving the first rubber-tired buggy in Michigan in 1894.

But he, too, foresaw the future of the automobile. His interest, however, centered on its tires. Then he severed his connections with the Consolidated firm and planned his own company to make automobile tires. He selected the city of Akron as best suited for his purpose, and on August 3, 1900, the Firestone Tire & Rubber Co. was started with Harvey Firestone as president. In January, 1932, he resigned as such to hold the newly created post of chairman of the board of the Firestone organization which includes 33 subsidiaries in North and South America and Europe and rubber plantations in Liberia, Africa.

A list of some of the more important executive positions held by Harvey Samuel Firestone, Sr., follows: chairman of the board: Firestone Tire & Rubber Co., Akron, Firestone Tire & Rubber Co. of California, Firestone Tire & Rubber Co. of Canada, Firestone Cotton Mills, Firestone Plantations Co., all from February, 1932, to February, 1938, Firestone de la Argentina, S.A.I.C., 1931-1938, Firestone Park Trust & Savings Bank, 1930-1938, Firestone Rubber & Latex Corp., 1937-1938; president: Firestone Tire & Rubber Co., Akron, 1900-1932, Firestone Tire & Rubber Co. of Canada, 1919-1932, Firestone Cotton Mills, 1924-1932, Firestone Footwear Co., (Firestone-Apsley Rubber Co.), 1925-1932, Firestone Plantations Co., 1925-1932, Firestone Park Trust & Savings Bank, 1916-1930, Rubber Association of America, 1916-1918, Firestone Steel Products Co., Xylos Rubber Co., Akron Home Owners' Investment Co., Coventry Land & Improvement Co., City Planning Commission of Akron, Ohio Council of Churches, 1923-1924; director: Firestone Tyre & Rubber Co. (Great Britain), Ltd., Bankers' Guarantee Title & Trust Co., Central Savings & Trust Co.; trustee: Akron City Hospital, Y.M.C.A.; an organizer of: Rubber Institute, Inc., Rubber Purchasing Agency, Firestone Hispania Rubber Co., Bilboa, Spain (1932); referee: International Auto Race, Indianapolis Motor Speedway; author: "Rubber: Its History and Development" (1922) and "Men and Rubber" (1926).

Besides he was a member of Ohio Council National Defense, United States War Committee of Eight, Rubber Division War Industries Board, 1917-1918, NRA tire code authority, U. S. and Akron chambers of commerce, Highway Education Board, John Burroughs Memorial Assn., New England Historical & Geneological Society, Ohio Society of New York, Society of Automotive Engineers, American Society for Testing Materials, American Chemical Society, Society of Industrial Engineers, Ohio Waterways Commission, Akron Real Estate Board, St. Paul's Episcopal Church, Akron, and University, City, Portage Country, Union, Fairlawn Country, Mayfield Country, India House, and Congressional Country clubs, and (honorary member) Akron Cavalry Club and its polo association.

Harvey Firestone was an outstanding opponent of the Stevenson Restriction Scheme. In 1923 he convened a crude rubber conference in Washington, D. C., against the British act. He had an important part in bringing about researches in the possibilities of producing rubber in the Philippine Islands and South America, and he encouraged the investment of American capital in rubber growing countries. Thus was the Liberian enterprise born in 1925. In 1928 a medal was presented him by friends and admirers in recognition of his services in breaking the English rubber monopoly.

His birthplace was a farm near Columbiana, O.; the date, December 20, 1868. He received his education at the country school, Columbiana High School, and a Cleveland business college. Mr. Firestone was the recipient of two honorary degrees: D. Bus. Admin., Mt. Union College, 1926; LL.D., Kenyon College, 1934.

The rubber manufacturer was always interested in the welfare of his employes. He built for them model homes, an employe clubhouse, an athletic field, a 36-hole golf course; he organized a savings bank for them and substantially encouraged every worthy Akron charity and those in many other communities. His hobbies included horses, prize cattle, model farms, and dairying. Mr. Firestone was a firm advocate of the use of rubber on the farm and sponsored many such developments.

On November 20, 1895, he and Idabelle Smith were married. She and their six children, Harvey Samuel, Jr., Russell Allen, Leonard Kimball, Raymond Christy, Roger Stanley, and Elizabeth Idabelle, survive. All five sons are now connected with Firestone organizations.

The tire maker's body was brought to his Akron estate by special car on February 10. Funeral services were conducted February 11. Interment was in the cemetery of his native village.

G. B. Comey

GEORGE B. COMEY, 80, died of a stroke in Los Angeles, Calif., on January 25. Previous to retiring from The B. F. Goodrich Co., Akron, O., in 1912, he had been with the company 34 years, having started in June, 1878, in the mechanical division. He had advanced to the post of general foreman of the molded goods department when he left.

In 1914 Mr. Comey took his family to California and made his home there. After leaving Akron, he retired from active business life, although he was interested with one of his sons in organizing the Globe Ice Cream Co., a successful Los Angeles concern manufacturing ice cream.

Mr. Comey is survived by his wife and five children. Funeral services and burial were in Los Angeles.

W. E. Maston

HEART disease caused the death, on February 2, in Philadelphia, Pa., of Willard E. Maston, vice president of the Eagle-Picher Lead Co. since 1928. He began his business career in the paint industry as an office boy for John T. Lewis & Brother, Philadelphia, and won many promotions with the firm. He was sales manager when he left in

1913 to become manager of the Philadelphia branch of Eagle White Lead Co. After the Eagle and Picher companies merged, he became, in 1925, director of sales of the resulting concern.

Mr. Maston was born in Philadelphia on February 14, 1883. He was graduated from the local public schools and Drexel Institute.

The deceased was very active in the associational activities of the paint industry and also held office in many of these organizations. Besides he was a member of the Chicago Rotary and Cincinnati and Kenwood Country clubs.

Funeral services and burial were in Philadelphia on February 5.

Surviving are the widow and their daughter.

J. H. Buckley

AFTER ten years of ill health John H. Buckley, 55, died last month and was buried in Spring Valley, N. Y., on February 10. He was the son of the founder of the J. W. Buckley Rubber Co., which began operations about 70 years ago and for a considerable period was the largest jobber of rubber goods in New York.

The deceased leaves his wife and a son, who is connected with the Mercer Rubber Co. of New York, Inc., 28 Warren St., of which the Buckley firm became a division three years ago.

Robert P. D. Graham

AFTER two years of failing health Robert P. David Graham, export and traffic manager of the Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., Canada, died on January 18. He had joined the company at Bowmanville in 1911 as assistant to the sales manager of the tire division and in 1918 he formed the export department. The deceased, who was born in Dundas, Ont., in June, 1874, had also been employed by the International Nickel Co., Sudbury, Ont., and the Pittsburgh Steel Co., Pittsburgh, Pa.

Robert P. D. Graham

Mr. Graham belonged to the Toronto Export Club, Board of Trade, Transportation Club, Canadian Manufacturers Association, and Baby Point Lawn Bowling and Hamilton Tigers Football clubs. He was a hockey fan and rugby enthusiast.

Married, he also leaves a 19-year old daughter.

S. N. Blakeslee

A FEW days after a major operation Stanley N. Blakeslee, president of the Alling Rubber Co., died on January 21 in Troy, N. Y. He had joined the company as manager of the Troy branch in 1912, became vice president in 1926 and president in 1934. His only other business connection was with Mathews & Willard, a division of the Scovill Mfg. Co., Waterbury, Conn., from 1893 to 1912.

Mr. Blakeslee was born in Watertown, Conn., on February 3, 1875. He was educated at the public schools there.

He was a 32nd degree Mason, a member of the Troy Chamber of Commerce, Troy Rotary Club, Troy Country Club, and Jerusalem Lodge, F. & A. M., and an acting elder of the Westminster Presbyterian Church. His hobbies were golf and fishing.

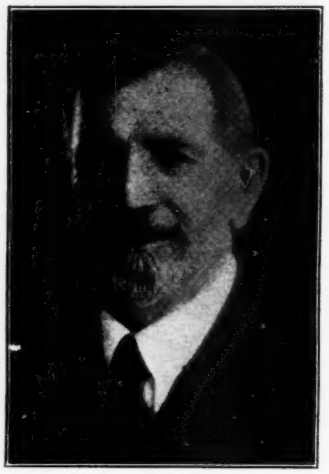
On October 6, 1899, Mr. Blakeslee and Miss Emily Curtis were married. A daughter and a son were born to them. Also surviving the deceased are two grandsons and a brother.

S. S. Miller

THE rubber industry lost its oldest active executive on January 29 when death, by a heart attack, claimed Stephen Samuel Miller, chairman of the board, Mohawk Rubber Co., Akron, O. He was born at Norton Center, O., February 7, 1856, but had lived in Akron since a lad of 12, where he was educated at the local grade and high schools.

After graduating from high in 1874 he was hired by the Excelsior Reaper & Mower Works and later by Aultman Miller Co., Buckeye Reaper & Mower Works, where he started as a foreman and remained 20 years.

His association with the rubber industry began in 1896 when he joined the old India Rubber Co. Two years later he became first superintendent of the Goodyear Tire & Rubber Co., but in 1900 he resigned to become factory manager of Kelly-Springfield Tire Co. After 12 years he left to form a company to purchase the Stein Double Cushion Tire Co., now known as The Mohawk Rubber Co. His first position with the new organization was as factory manager. He became president in 1924 and, when he retired as such in 1930, was named chairman of the board of directors. Besides this office Mr. Miller approved all tire specifications and materials used by the company.



S. S. Miller

He was one of the pioneers in the industry, and foremost among his achievements is the development of the first flat tread tire.

He belonged to O.N.G. McKinley's Own Band, the Masonic Order, The Modern Woodman of America, and Four F, Akron City, and Congress Lake clubs. But his real hobby was croquet.

On February 3, 1892, Mr. Miller married Miss Anne Seiberling, sister of F. A. and C. W. Seiberling. The Millers have two sons. They all survive him.

Funeral services were conducted on January 31. Burial was in Glendale Cemetery.

George G. Butz

GEORGE G. BUTZ, 72, for 33 years superintendent of plant protection at the Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind., died on January 22 after a two months' illness.

C. O. Gleghorn

C. O. GLEGHORN, manager of the Chicago manufacturers' sales department of The B. F. Goodrich Co., died of pneumonia in Detroit on February 9. Born near Akron in 1887, he joined Goodrich as office boy in 1907 soon after graduating from high school. He was placed in the sales department a few years later, represented the company in the Midwest, and took leave of absence in 1915-16 to enter the motor transport section of the army which General Pershing headed into Mexico. Returning to Goodrich, he was sent to Detroit, in 1919, in the district sales office. After having been in the Detroit manufacturers' sales office since 1925, Mr. Gleghorn was named to the Chicago post early last month.

He was a member of the Detroit Athletic Club, American Legion, and National Aeronautical Association. He

leaves his wife, his father, and one sister. Funeral services and burial were in Detroit.

W. S. Ballou

ANOTHER veteran rubber man was called from the ranks of the living when Walter Seymour Ballou died January 25 at his home in Providence, R. I. He began his successful career in the rubber industry in 1868 when he joined the Woonsocket Rubber Co., Woonsocket, R. I., as office boy. His advancement was rapid. In 1871 the firm opened a store in New York, N. Y., and Mr. Ballou was placed in charge. After 17 years he returned to Woonsocket to become sales manager for the concern. He served as secretary from August 26, 1889, to June 29, 1896. In 1896 the United States Rubber Co. took over the company, and Mr. Ballou resigned soon after.

That same year Joseph Banigan formed the Joseph Banigan Rubber Co., Providence, of which Mr. Ballou was an incorporator, secretary-treasurer, and a director. When Mr. Banigan died in 1898, U. S. Rubber bought the firm, and Mr. Ballou acted as president, general manager, secretary, and a director. On April 26, 1909 the deceased was elected president and general manager also of the Woonsocket Rubber Co. concern. He held the latter position until April 29, 1912, and the former until July 5, 1929. He was on the board from May 11, 1903, until July 5, 1929.

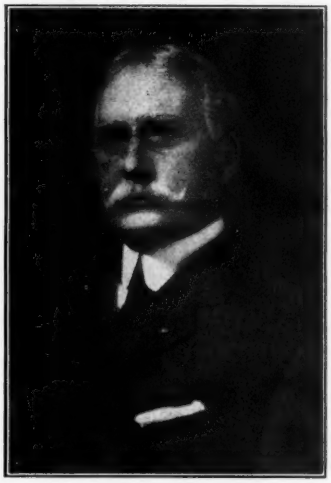
Mr. Ballou had also been connected with the American Wringer Co. since its founding in 1891 by Mr. Banigan and had spent several years as secretary and then as president. Besides he had been a director of the following concerns: American Dunlop Tire Co., General Rubber Co., Goodyear's India Rubber Glove Mfg. Co., Meyer Rubber Co., Naugatuck Chemical Co., National India Rubber Co., Pacific & Idaho Northern Railway Co., Revere Rubber Co., Rubber Regenerating Co., Shoe Hardware Co., Wardwell Braiding Machine Co., Industrial Trust Co., United States Tire Co., and United States Rubber Co. (May 12, 1893, to May 19, 1896; May 19, 1903, to December 13, 1928). He was also a member of U.S. Rubber's executive committee from May 20, 1904, to December 13, 1928. The company placed him on its retired list January 1, 1930.

During his lifetime Mr. Ballou held membership in the following organizations: Adirondack Fish & Game League, Hope, Squantum, Turks Head, Lotos, and Union League clubs, Republican Party, and Military Order of Foreign Wars. He was, moreover, a colonel of the old Rhode Island State Militia and saw 14 years' service with the Twenty-third Regiment, New York State National Guard, at Brooklyn. His greatest pastime was fishing.

He was born in Cumberland, R. I., on March 2, 1849, and attended public schools there and the Dean Academy, Franklin, Mass.

On June 9, 1875, Mr. Ballou and Miss Ella Hall Corey were married. She survives him, but their only child died in 1888.

Funeral services were held at the Central Congregational Church, Providence, on January 28. Burial was in Swan Point Cemetery.



W. S. Ballou

NEW ENGLAND

LAST month in New England retail sales were ahead of those of a year ago, but manufacturing lines showed little sign of improvement. The leather footwear business has been well above the level of the last quarter of 1937, but, currently, some hesitation is in evidence because of a further weakness in the hide market. Textiles continue flat; although scattered improvement in demand is noted in some quarters, manufacturing operations are very low. There appears to be some increasing interest which, it is hoped, will materialize into buying within the next month.

The Hill & Lacross Co., manufacturers of tapes, braids, and elastics, East Greenwich, R. I., upon the petition of C. C. Lacross Floody, had a receiver appointed to it, Conrad K. Strauss, by Presiding Justice J. O. O'Connell, of Providence County Superior Court. Later an allowance of $600 was made the receiver for his services, although he had requested $1,500. Inasmuch as the receivership proceedings in the State court were followed by bankruptcy proceedings in the federal court and necessitated the transfer of the case to the United States District Court the question of the approval of the fee is yet to be determined in the federal court. The schedules filed in the bankruptcy proceedings show liabilities aggregating $117,689 and assets of $54,214. The largest creditors include: C. C. Lacross Floody, petitioner for receivership, $8,548; United States Rubber Co., New York, N. Y., $8,720; Van Gelder Yarn Co., New York, $5,924; Thied Dyeing Mills Co., Centreville, R. I., $3,841; Catlin Farish Co., New York, $3,403; Erwin Yarn Co., Philadelphia, Pa., $2,890; and General Spool Co., Woonsocket, R. I., $800, unsecured.

Phillips-Baker Mutual Relief Association, composed of former workers of the Phillips-Baker Rubber Co., Providence, R. I., will receive 33% of the assessments paid in by each member under a decree entered in the Superior Court for Providence County by Presiding Justice Jeremiah E. O'Connell upon allowance of the report of co-receivers. The latter, John J. King and Anna Smith, were each awarded $200 for their services, and counsel was awarded $517.92. Assets totaled $6,472.21 in cash, and the distribution will be among 980 members on the basis of amounts paid into the association.

Ernest I. Kilcup, president and managing executive of the Davol Rubber Co., Providence, R. I., has been elected president and a director of the Phenix National Bank of that city.

The Fiberloid Corp., Springfield, Mass., at a stockholders' meeting on February 16 approved the transfer of its properties and assets to Monsanto Chemical Co., St. Louis, Mo., in exchange for 148,523 shares of Monsanto common stock. Out of 254,611 shares of Fiberloid stock outstanding, 244,807 shares were voted in favor of the transaction, and no votes were cast against the transaction.

Textile Machinery & Brush Co., to be located on Concord St., Framingham, Mass., after March 10, is a combination of the Textile Brush Co., Natick, Mass., and the Bristle Stretcher Expander Co., 32 Kent St., Somerville, Mass. The new company will continue the manufacture of cloth expanders, wrinkle eliminators, and industrial brushes as well as a variety of rubber and textile machinery.

The Fisk Tire Co., Inc., Chicopee Falls, Mass., has announced that after 13 years its famous "Time to Re-Tire" boy is back on outdoor advertising boards. The inaugural sign, erected at Enfield, Conn., utilizes the "streamliner" board for the first time outside of metropolitan areas; and the new stimsonite reflector button is used for the first time on a national scale. Signs featuring "Fisk Safti-Flight" tires will be used throughout the United States, at approaches to 30 cities. Sign locations are being selected by H. R. Hurd, Fisk advertising manager.

FINANCIAL[1]

Unless otherwise stated, the results of operations of the following companies are after deductions for operating expenses, normal federal income taxes, depreciation, and other charges, but before provision for federal surtax on undistributed earnings. Most of the figures are subject to final adjustments.

Baldwin Rubber Co., Pontiac, Mich. December quarter: net profit, $73,957, equal to 23¢ each on 316,757 shares of $1 par capital stock outstanding, against $66,162, or 21¢ a share in the preceding quarter. On December 31, 1937, current assets were $1,068,683, including cash of $295,323, and current liabilities were $211,597. These compare with current assets of $1,115,215, including cash of $88,517, and current liabilities of $501,158 on December 31, 1936.

Brown Rubber Co., Inc., Lafayette, Ind. Year ended January 1: Net profit, $122,297, after provision for the surtax on undistributed earnings, compared with $141,091 for the 53 weeks ended January 2, 1937.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Year ended December 31, 1937: net income, $88,031,943, after federal taxes, equal after dividends on preferred and debenture stocks, to $7.29 a share on the 11,065,762 common shares outstanding. This compared with a net income of $89,884,449, or $7.56 a share on the outstanding common shares in 1936. Surplus account at the year-end totaled $244,772,477, against $226,236,595 at the end of 1936. Current assets amounted to $189,358,765, and current liabilities, $33,858,918. Net working capital was $155,499,747. Income received from its investment in the General Motors Corp. was $36,672,635, against $44,004,389 in 1936. Sales and other operating revenues for 1937 were approximately $286,000,000, an increase of about 10% over 1936.

Flintkote Co., 50 W. 50th St., New York, N. Y., and subsidiaries. For 1937: net income, $1,005,423, equal to $1.50 each on 670,346 outstanding shares, contrasted with $1,171,034, or $1.75 a share on 668,046 shares, in 1936.

Goodyear Tire & Rubber Co., Akron, O., and subsidiaries. For 1937: net consolidated operating earnings after all prior charges, including taxes, depreciation, and interest, but before adjustments, totaled $17,600,029. After providing $10,342,742 to reduce commitments, inventories of raw materials, and rubber and cotton content finished products to the lower of cost or market, net profit amounted to $7,257,287. Earnings, before adjustments, were equivalent to $6.97 per share of common stock outstanding at the end of the year and $1.94 per share of common stock after such inventory adjustments. Consolidated net sales totaled $216,174,513, against $185,915,674 for 1936, a 16% increase, to make sales the largest for any year since 1929. Current assets were $108,635,091, including cash on hand and government securities of $11,612,064, as against current liabilities of $9,137,196. The ratio of current assets to current liabilities was 11.9 to 1, and the company had no bank debt. Inventory of raw materials and finished products, valued at the lower of cost or market, amounted to $73,987,017. Tax payments on domestic operations for 1937 amounted to $12,799,801, equivalent to $6.22 per share on the common stock outstanding December 31. The company's program of rearrangement of productive capacity and establishment of new plants, initiated in 1936, was substantially completed during 1937 and at a minimum capital outlay, financed entirely out of earnings. Net consolidated working capital, which amounted to $98,456,388 on December 31, 1935, prior to the beginning of this program was $99,497,895 at December 31, 1937.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., Canada. For 1937: consolidated net profit, $1,364,347, equal, after preferred dividends to $4.14 each on 257,260 no-par shares of common stock. In 1936 consolidated net profit was $1,516,344, or $4.73 a common share.

Monsanto Chemical Co., St. Louis, Mo., and subsidiaries. For 1937: net profits, $5,162,511. After deductions for minority interests and provision for preferred dividends, earnings applicable to Monsanto common stock were $4,898,309, equivalent to $4.40 a share on the 1,114,388 shares outstanding De cember 31. After allowances for minority interests, 1936 net earnings applicable to common stock were $4,468,703, or $4.01 a share on the 1,114,409 shares then outstanding.

National Lead Co., 111 Broadway, New York, N. Y., and domestic subsidiaries. For 1937: consolidated net income, $4,886,951, after deduction of depreciation, taxes, and operating expense, equal, after usual preferred dividends, to 94½¢ per share on 3,095,100 shares of common stock, against $7,232,530, or $1.71 per share for 1936. While final figures are not in from foreign subsidiaries, the company's equity in undivided profits or losses in foreign subsidiaries or controlled companies not wholly owned is estimated to be 20¢ per share against 12¢ in 1936. Earnings of two German companies are not included in this estimate. Sales totaled $91,947,302 in 1937, against $78,764,589 in 1936. The consolidated balance sheet as of December 31 showed current assets of $38,678,001 and liabilities of $5,777,981; cash, $6,900,065; U. S. Government securities, $1,147,888; and inventories of $22,085,738.

New Jersey Zinc Co., 160 Front St., New York, N. Y. For 1937: net income, $7,871,914 after federal taxes, depreciation, depletion, contingencies, and other charges. This was equivalent to $4.01 a share on 1,963,264 shares of capital stock. It compared with a net profit of $5,250,789, or $2.67 a share, for 1936. Quarter ended December 31: net profit, $1,347,986 after federal taxes and other charges, equal to 68¢ a share, against a net profit of $2,172,145, or $1.10 a share, in the preceding quarter, and a net profit of $1,657,204, or 84¢ a share, in the corresponding quarter of 1936.

Raybestos-Manhattan, Inc., Passaic, N. J. For 1937: net income, $1,924,879.60, or $3.03 per share, after providing $725,345.96 for depreciation, $428,523.19 for federal and state income taxes, $150,000.00 for the surtax on undistributed profits, and paying $180,366.14, or the equivalent of 28¢ per share to employes for vacation pay and Christmas bonus. Total assets at December 31, 1937, amounted to $18,384,801.89, including $9,348,046.28 of current assets, equivalent to six times the current liabilities. There were no banking, or funded debt, or other capital obligations outstanding.

United Carbon Co., Charleston, W. Va., and subsidiaries. For 1937: net profit, $2,350,486, after interest, depreciation, depletion, minority interest, federal and state income taxes, and $22,000 provision for surtax on undistributed profits. This was equivalent to $5.90 a share on 397,885 shares of no-par common stock and compared with $2,202,850, or $5.54 a share in 1936. On December 31, 1937, current assets were $3,040,652, and current liabilities $792,832, against $2,752,369 and $912,199, respectively, at the end of 1936. Cash increased to $921,389 from $854,172. Inventories were $868,133, against $486,711. Oscar Nelson, president, said that about 42% of total earnings in 1937 were derived from carbon black compared with 1936. The revenue from the sale of natural gas amounted to $3,363,338 and exceeded that of any previous year. The gain amounted to almost 24% over 1936. Deliveries averaged 118,762,000 cubic feet a day, against 107,292,000 in 1936.

United Elastic Corp., Easthampton, Mass. For 1937: net profit, including $59,247 income from investments and $30,635 on sale of securities, amounted to $64,732, equal to 41¢ each on 156,640 no-par capital shares, excluding 8,990 shares in treasury. Net profit in 1936 was $99,430, or 63¢ a share.

[1] Dividends Declared on p. 73.

EASTERN AND SOUTHERN

RECENTLY the rate of industrial activity has moved within a relatively narrow range, following the moderate recovery from the year-end lows, but the general tendency seems downward.

One authority reports that during the last third of 1937 industrial production dropped as much as during the 29 months following the peak of 1929. Factory output, about 25% below a year ago, is at the lowest level since late 1935. A rebound from this drastic decline is to be expected, but whether there can be a sustained revival at this stage is a question. Further adjustments are necessary to liquidate the inflated costs built up during the speculative period which culminuated last spring. But this task, however, is difficult since taxes and wages constitute an increasing proportion of costs, which consequently are becoming more and more rigid. Many major industries are now operating at a loss; and since their depleted surpluses have not been rebuilt because of the tax on undivided profits, the industries may be compelled to make wage adjustments to bring the price of products within the buying range of the consumer.

In some sections of the East and South trade continues to lag, without prospect of immediate improvement; government employment is off, and building is lower than for some years past at this time. Indeed industrial as well as government lay-offs are gaining. Machine tool sales have also declined; and steel is operating at about 30% capacity. It is hoped that the new housing act will prove stimulating.

A recent survey reveals that both prices of manufactured goods in general and wages were relatively stable throughout 1935 and the first 10 months of 1936. In October, 1936, the indexes of both wages and prices stood at approximately the average for the preceding 21 months. In November, and from that month on, average hourly earnings of factory workers increased to a peak in November, 1937, of 17.5% above the October, 1936, level. The rise in wholesale prices reached its peak in September, 1937, with an increase of 8.7% over October, 1936. Over half this increase in prices was lost during the following quarter. The decline in wages from the high point in the same period amounted to one-half of 1%.

Stockwell Rubber Co., specializing in industrial rubber goods, 535 Arch St., Philadelphia, Pa., is more than doubling its store space. According to President F. E. Stockwell, the firm is having a new building reconstructed to meet its wants that will also take in 537 Arch St. The building, constructed entirely for the use of the rubber concern, when completed, will be one of the largest rubber stores in the East.

Cyanamid Anniversary

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., recently celebrated its thirtieth birthday. The organization was started in 1907 for the manufacture and sale of a single nitrogen fertilizer material; today it employs approximately 10,000 individuals and serves more than a hundred industries, covering the whole world. Production is carried on in more than 30 plants and mines located in relation to sources of raw materials and consumer markets.

The company was organized in 1907, and a cyanamid plant built at Niagara Falls, Ont., Canada. Calcium cyanamid, the company's initial product, was first shipped December, 1909. With the World War the company's activities broadened and products become more diversified. Then, around 1923 came the production of guanidine accelerators, used in vulcanizing rubber, and other derivatives of hydrocyanic acid. In 1929 the company acquired the Kalbfleisch Corp., one of the oldest in the American chemical industry, to handle Cyanamid's activities in general industrial chemical fields. The name of the acquired organization was later changed to American Cyanamid & Chemical Corp., and it produces and sells materials and contributes technical service to almost every chemical-consuming industry, including rubber. In 1933 American Cyanamid Co. and Pittsburgh Plate Glass Co., acting jointly, formed Southern Alkali Corp. The next year Cyanamid acquired a Canadian concern. The firm maintains five research laboratories also, including one at Stamford, Conn., largely devoted to rubber.

Travelcade of Plastics

The dramatic story of the development of the plastics industry will be presented at the Museum of Science & Industry, Rockefeller Center, New York, N. Y., March 1 to 31, inclusive. On view will be a reproduction of a corner in the little laboratory in Yonkers, N. Y., where, in 1907, Dr. L. H. Baekeland developed Bakelite resinoid, a discovery which marked the beginning of our modern plastics industry. Exhibits will indicate the uses of plastics in aviation, household appliances, building, business machines, abrasives, home furnishings, photography and optics, packaging, radio, machinery, fashions, automobiles, paints and varnishes, communications, amusements, music, and the health of humanity.

When the Travelcade leaves Radio City, it will start on a city-to-city tour for a period of two months in New Jersey. After that it will be installed for the remainder of the year in the Franklin Institute, Philadelphia, Pa.

Givaudan-Delawanna, Inc., manufacturer of aromatic chemicals, 80 Fifth Ave., New York, N. Y., last month granted a leave of absence to Sales Manager R. M. Stevenson, who will devote much of his time to his manufacturers' agency business, Detroit, Mich., which during his two-year absence has been in charge of John K. Stevenson.

Franklin Research Co., 5134 Lancaster Ave., Philadelphia, Pa., announced at its recent general sales meeting that plans have been formulated for a much more aggressive campaign in the more specialized phase of its business for 1938. Whereas in the past the company has pursued an active part in the introduction of wax emulsions to the floor maintenance material field, its activities during 1937 were extending themselves into a much broader and more highly diversified use for water emulsion waxes, including such interesting applications as those to citrus fruit, vegetables, paper, real and imitation leather, and mechanical and molded rubber goods. Now that this company controls the Bridgeman Schade patent, U. S. No. 1,943,468 it apparently feels more encouraged than ever before to undertake added responsibilities in both the research and merchandising fields for water emulsion waxes.

National Association of Waste Material Dealers, Inc., Times Bldg., New York, N. Y., because it is celebrating its silver jubilee this year, is making special arrangements to entertain wives and daughters of members who attend the convention, to be held March 14, 15, and 16 at the Hotel Astor, New York, N. Y. This is the first time that such an entertainment policy has been adopted. In conjunction with this convention meetings will be held of affiliated organizations, which include the Scrap Rubber Institute.

Louis J. Plumb, president of the U. S. Rubber Reclaiming Co., Inc., 500 Fifth Ave., New York, N. Y., left on February 10 for Bellair, Fla., where he expected to enjoy the southern sunshine for a period of three or four weeks.

Richmond Rubber Co., Inc., Seventh and Leigh Sts., Richmond, Va., recently increased its capital stock from $50,000 to $200,000. The firm, which was founded in 1922, handles Gillette tires and Goodrich mechanical rubber goods and serves about 2,000 accounts distributed over Virginia, West Virginia, North and South Carolina, and Maryland. Officers include E. R. Patterson, president; G. W. Sutton, treasurer; J. E. Galloway, secretary; and A. W. Robinson, service manager. Mr. Patterson for some time had been assistant manager of the Philadelphia branch of the Diamond Rubber Co.

Commodity Exchange, Inc., 81 Broad St., New York, N. Y., recently reported that a plan for continuing rubber control five more years after expiration of the present scheme at the end of 1938 is being submitted to signatory governments. Under the existing agreement the International Rubber Regulation Committee has until March 31, 1938, to submit its definite recommendations to the participating governments on the question of an extension of the restriction plan. The participating governments, in turn, have until June 30, 1938, to take a stand on the committee's suggestions. Following that deadline, negotiations over the extension of restriction will begin in earnest.

National Association of Manufacturers at a recent meeting of the directorate in the Hotel Waldorf-Astoria, New York, N. Y., elected as president Charles R. Hook, president of American Rolling Mill Co., Middletown, O. Among the national vice presidents named was Edgar M. Queeny, president of Monsanto Chemical Co., St. Louis, Mo. Included among the regional vice presidents elected were Lammot du Pont president of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., and H. W. Prentis, Jr., president of Armstrong Cork Co., Lancaster, Pa.

I. B. Kleinert Rubber Co., 485 Fifth Ave., New York, N. Y., last month at the Hotel Pennsylvania held its second annual parade of American fashions before about a thousand notion buyers. Featured by the company were its crepe rubber bathing suits made in princess silhouette with matching panties; beach accessories; foundation garments; dress shields, etc. President Ralph K. Guinzburg recently announced a 15% increase in the firm's advertising budget for 1938.

Rubber Reclaimers Association last month held a meeting in New York at which the following officers were elected: president: V. H. Dingmon, Xylos Rubber Co., Akron, O.; vice president: E. H. Brooks, Goodyear Tire & Rubber Co., Akron; treasurer: J. P. Coe, Naugatuck Chemical, 1790 Broadway, New York; secretary: M. B. Miller; directors: A. D. Brandt, Philadelphia Rubber Works Co., Akron; Irving Laurie, Somerset Rubber Reclaiming Works, New Brunswick, N. J.; H. S. Royce, Boston Woven Hose & Rubber Co., Cambridge, Mass.; Mr. Dingmon; and Wm. Welch, Midwest Rubber Reclaiming Co., East St. Louis, Ill.

Vulcanized Rubber Co., Morrisville, Pa., has greatly reduced working hours, following a downward trend in business conditions.

Hohwieler Rubber Co., Morrisville, Pa., has many small orders on hand for baseball plate equipment and fishing tackle, and that business has shown some improvement in that line.

Southeast Families Lead in Pooling Earner Wages

Meeting family expenses by pooling wages is stronger in Southeast villages than in other regions, according to a study by the Bureau of Home Economics of 140 villages throughout the United States.

In the Georgia and South Carolina villages 38% of the white families and 66% of the Negro families interviewed had more than one earner. For North Carolina and Mississippi villages the respective percentages were 30, and white families; 65. In the other areas studied this percentage ranged from 13 in Kansas and North Dakota villages to 24 in Pennsylvania and Ohio.

Among the self-supporting native whites the wage-earning group reached its highest percentage in 13 Pennsylvania and Ohio villages, where 60% of the families had wage earners as the principal income producers. The lowest percentage, 27, was in North Carolina and Mississippi.

In the Georgia and South Carolina villages 44% of the families were in the wage-earner class. The highest percentage of business and professional families, 47, fell in the Kansas and North Dakota villages, where industries are few.

In average size village families ranged from 3.5 persons in California to 4.1 in Kansas and North Dakota. In each group of villages the relief families averaged larger than families not on relief during the year studied. Relief families were not analyzed as to occupational source of incomes.

U. S. Tire Dealers Mutual Corp., 1790 Broadway, New York, N. Y., recently started its U. S. Royal Master Tire radio show over the Columbia Broadcasting System, Wednesday nights, from 9:30 to 10:00 p.m. E.S.T. Featured on the program are Lew Lehr, comedian, Buddy Clark, singer, Jane Pickens, soprano, and Ben Bernie and "all the lads." At the initial broadcast was Howard N. Hawkes, general sales manager of the tire company.

Chemist Advisory Council, Inc., 300 Madison Ave., New York, N. Y., an outgrowth of the Chemists Unemployment Committee, whose work it will take over, recently was formed. Functioning nationally as a permanent agency to promote the general welfare of unemployed chemists and chemical engineers, the council will seek to reduce unemployment in the chemical industry. Dr. Walter S. Landis, vice president of the American Cyanamid Co., is president of the council.

Lee Tire & Rubber Corp., Conshohocken, Pa., recently held its annual stockholders' meeting at which President John J. Watson stated that profits in November and December, the first two months of the company's fiscal year, were slightly larger than those of the same months of 1936, despite some decline in volume of business.

Jones-Dabney Co., Inc., manufacturer of lacquers, varnishes, and enamels, Louisville, Ky., through P. H. Cathcart, sales manager of the synthetic resin division, has announced the appointment of the H. M. Johnson Co. to handle its synthetic resin and lacquer base sales in the East. H. M. Johnson, who has organized a new technical sales organization, has his main office in Newark, N. J., and maintains direct service in the Boston, New York, Philadelphia, and Baltimore territories. Mr. Johnson has long been the representative of Beck Koller & Co. in the eastern territory and was vice president in charge of eastern sales for several years.

Lew Lehr, Buddy Clark, Howard N. Hawkes, Jane Pickens, and Ben Bernie on the U. S. Royal Master Radio Program

OHIO

BUSINESS activity in Ohio showed little change last month. The following remarks on the rubber industry are taken from a recent Dun & Bradstreet, Inc., report.

Volume of general rubber goods sales for 1937 reached an eight-year high. Unremitting research work has widened the use of rubber in such varied new fields that all annual totals back to 1929 were exceeded even though production, shipments, and original equipment sales of automobile tires did not reach the 1936 figures. Orders to wholesalers went from 20 to 30% over the previous year's; while retail sales rose from 15 to 20% from the 1936 dollar value. Consumption of crude rubber was 5.5% less than the peak set in 1936.

Not all divisions of the rubber goods industry were affected by the downward trend in production the last half of 1937. Output of rubber belting, specialties, and some mechanical and industrial goods did not go much under the previous year's until December. This fact pushed the 1937 volume 15 to 25% ahead of that for 1936. More unit pairs of rubber footwear also were turned out than in 1936. Automobile tire production began to decline after the year's high in March.

For the first time since 1928 there was a year-to-year increase in replacement sales of automobile tires in 1937. The total rose to approximately 30,000,000 units from 29,700,000 in 1936, a 1% gain. But sales of original equipment dropped 20.8%, from 28,416,000 tires for 1936 to 22,500,000 for 1937. This reduction lowered total 1937 sales to 52,500,000 tires, 9.7% under the 58,116,000 sold in 1936. Replacement sales for 1938 have been set at 31,000,000.

For the full year of 1937 only two applications were filed by concerns in the rubber goods industry for reorganization under Section 77-B. Both were by manufacturers, contrasting with three for 1936 and four for 1935. For 1934 there were also two cases listed for manufacturers and one for a retailer, which brought total applications for the four years to 12.

Bankruptcies for 1937 were the fewest for any year in the history of the rubber goods industry. The total of 15 dropped 42.3% from the 26 for 1936, the previous low, and 93.6% from the peak set at 234 for 1928. Liabilities of $166,000 for 1937 were also at a new low, going 82% under the 1936 total of $922,000 and 97.6% under the all-time high of $6,982,000 for 1928.

An insolvency record of rubber goods manufacturers from 1927 to 1937 shows:

MANUFACTURERS
(Includes Automobile Tires, Rubber Goods, Footwear, Heels, and Soles)

Year	No.	Liabilities
1927	36	$2,950,000
1928	32	4,912,000
1929	24	2,971,000
1930	20	3,220,000
1931	27	2,067,000
1932	26	1,368,000
1933	29	2,067,000
1934	13	117,000
1935	11	243,000
1936	10	714,000
1937	5	28,000

These statistics of failures in the rubber goods trade are exclusive of applications under Section 77-B. From June 7, 1934, when Section 77-B of the New Bankruptcy Act became effective, to December 30, 1937, applications were filed by eleven manufacturers and one retailer.

American Road Builders Show, held in Cleveland, January 17 to 22, set a new attendance record and attracted the greatest number of exhibits in the history of the American Road Builders Association. Survey of the displays revealed a preponderance of machinery with rubber tire equipment. It was the concensus of opinion that rubber would almost entirely replace steel wheel equipment before next year's show.

At the American Road Builders Show, S. F. Beatty, President, Austin-Western Machinery Co.; Harry C. Merritt, Vice President, Allis-Chalmers; J. W. Thomas, President, and Leonard K. Firestone, Trade Sales Manager, Firestone Tire & Rubber Co.

The Cincinnati Rubber Mfg. Co., Cincinnati, held an annual meeting on February 8 at which all officers and directors were reelected.

American Zinc Sales Co., distributer of American Zinc, Lead & Smelting Co.'s products, Columbus, has announced through Thornton Emmons, vice president in charge of sales, that N. S. Worrell, of the sales division, has been appointed Central District manager, with headquarters in Columbus. He will have charge of the same territory he has previously been covering.

Seiberling Rubber Co., Akron, according to President F. A. Seiberling has secured an extension to November 15, 1938, of $2,350,000 of 6% debenture bonds which matured November 15, 1937. The company hopes to put through a reconstruction plan in the interim whereby it can take up the bonds in their entirety, although with the present confusion in the business world it is difficult to plan with any definiteness. Mr. Seiberling further declared that despite the current slump the firm's business with dealers is steadily increasing over the past year.

The Dayton Rubber Mfg. Co., Dayton, reports difficulty in keeping up with orders for its new Deluxe tire on which a number of patents have been obtained covering the method of making the carcass, the tread design, the method of producing the molds, and the process of curing the tires. Production capacity has been stepped up twice since November 1, and a further increase is planned immediately. In such a crowded art as tire manufacture it is rather unusual in this day to make developments sufficiently original to permit of a series of patents to cover the entire tire through its component parts. This new product is said to be the result of a serious development program covering a period of seven years.

General Tire Elections

William F. O'Neil was reelected February 9 by directors of the General Tire & Rubber Co., Akron, as president and general manager, for his fifteenth annual term as head of the fifth largest tire manufacturing company in the country. Other reelected officers are: W. E. Fouse, vice president and secretary; C. J. Jahant, vice president; T. Spencer Shore, treasurer; H. R. Jenkins, assistant secretary; and T. S. Clark, assistant treasurer.

Company directors were reelected by

the stockholders at their annual meeting which preceded that of the directors. The directors include: Messrs. O'Neil, Fouse, and C. J. Jahant, G. F. Burkhardt, Charles Herberich, T. F. O'Neil, and J. R. Kraus.

President O'Neil addressed the stockholders briefly on the business of the past fiscal year and the prospects for the year ahead. His annual report had been submitted to stockholders on January 18, from which date the stockholders' annual meeting had been adjourned to February 9, in order to comply with a ruling of the New York Stock Exchange requiring that copies of annual reports of all member firms must be in the hands of stockholders 15 days in advance of the annual meeting.

Change in the date of the annual meeting from the third Tuesday in January to the second Tuesday in February was approved.

O'Neil on Automatic Machinery

"Criticism of the increase in the use of automatic machinery in modern manufacturing, heard recently in some quarters, is without justification," declared Mr. O'Neil in an address at the Advertising Club of New York at the clubhouse, 23 Park Ave., New York, N. Y., on February 18.

"Automatic machinery does not make fewer jobs; it makes more jobs," asserted Mr. O'Neil. "They may be different jobs, but more jobs, nevertheless.

"Labor-saving devices alone have made possible most of the larger industrial operations in which great numbers of men are employed. Without such devices, the $500 automobile would never have been made possible.

"Throughout the entire industrial picture, more people are working today because of automatic machinery and the increased production that it makes possible.

"To men engaged in advertising, this means that there are new markets to be captured, new groups of customers to be reached and new desires to be satisfied.

"America has more automatic machinery than all of the rest of the world put together and, because of that fact, it is able to put more of its people to work than any other country."

Goodyear Activities

Silver Jubilee of Mechanicals

Twenty-fifth anniversary of the organization of Mechanical Goods Division of the Goodyear Tire & Rubber Co., Akron, was celebrated last month with four outstanding veterans of the rubber industry who have been with the division since its inception, as guests of honor at a dinner signalizing the occasion. The veterans are W. M. "Pop" Metzler, 52 years in the rubber industry; Hal Campbell and D. R. Burr, 43 years; and R. R. "Pop" Peebles, 31 years. All four joined Goodyear in 1913 and have played important parts in building the company's Mechanical Goods Division to its present position. Mr. Metzler, 77, oldest man active in rubber manufacturing in the United States, has been a consulting engineer with Goodyear since 1917; while Mr. Campbell, 61, is a division superintendent of mechanical goods. Mr. Burr, 65, since 1933 has been a consulting manager of the mechanicals division; and Mr. Peebles, 69, has been manager of the matting, packing, and molded goods sales since 1931.

Goodyear has manufactured mechanical rubber goods in its Bowmanville, Ont., Canada, plant since 1909, but did not establish its American operations until 1913.

New Sales District

Goodyear recently created a new Cleveland district for the sale and distribution of mechanical rubber goods, with headquarters in the company's tire sales district office at Cleveland. This new district, formerly a part of the Pittsburgh sales territory, includes Akron, Youngstown, Canton, and the area bounded by those key cities.

Manager of the new district is H. D. Foster, Cleveland territory mechanical goods salesman for Goodyear since 1924. Succeeding him as Cleveland territory salesman is W. L. Clark, transferred from the company's Akron mechanical goods staff. He also will headquarter at Cleveland.

Safety Contest

According to a recently announced plan by the Goodyear safety department, the Akron plants for the 1938 contest have been divided into 11 units or divisions, each of about the same number of employes, and each unit competing not only against the other units, but also against the plants and mills located outside Akron. Under this setup there are now 30 units competing for the Cliff Slusser Interplant Safety Trophy.

Board Meeting

At a meeting of the Goodyear directorate on February 14, George A. Sloan was elected a director to succeed the late Newton D. Baker. At the same time George A. Martin was named to the executive and finance committees.

Goodrich News

New Appointments

E. T. Campbell, formerly assistant manager of petroleum sales at the Akron headquarters of The B. F. Goodrich Co., has been transferred to New York, N. Y., as assistant manager of petroleum sales in the eastern division, announced C. B. O'Connor, general sales manager of the tire division. In that post Mr. Campbell succeeds William Sewall, recently named manager of the petroleum sales department. Morris A. Starr, Atlanta, Ga., petroleum sales representative takes Mr. Campbell's place as assistant manager of petroleum sales in Akron and is in turn succeeded by E. H. Fitch as Atlanta representative.

Boston Meeting

Headed by W. C. Behoteguy, manager, automobile tire sales, officials from Goodrich headquarters on February 4 held an advertising and sales conference in the Hotel Statler, Boston, Mass., with L. L. Black, Boston district manager and other members of the company's sales organization there. Others from Akron were E. D. Nathan, assistant advertising manager, tire division, and E. D. Hughes, assistant sales promotion manager. Others present included Frank E. Reardon, sales promotion manager, J. A. White, district operating manager, W. W. Schwartz, retail sales supervisor, E. H. Mueller, credit manager, and W. A. Donovan, wholesale sales supervisor, all of Boston. Mr. Black stated that J. H. McArdle, E. P. Collins, and G. W. Myers, salesmen at the Boston branch, have been awarded prizes for their accomplishments in the Goodrich "Trade Expansion" contest, which is to run throughout the year. Twenty-seven divisions are competing. A feature of the conference was the showing of a five-reel motion picture relating to the manufacture and the performance of Goodrich tires.

40-Year Group

Fifteen of the most experienced men in the rubber industry, each of whom has been employed by Goodrich for 40 or more years, have formed the Forty-Year Group, composed exclusively of those with the company four decades or longer. Goodrich was founded in 1870. Those in the group are: David N. Suloff, 49 years' service; Peter Seiler, 48 years; Fred Meier and Oscar Lundgren, 47 years; B. F. Stauffer and Irving Kepler, 45 years; Mel Palmer and Lee R. Miller, 44 years; Albert Simmons, 42 years; Frank Weirath, William Stark, Ed Danner, Charles Kelley, and A. C. Capron, 41 years; and John E. Noonan, 40 years. Each of these veterans was presented a diamond-studded 40-year service pin by the company.

Large Fire Hose Order

One of the largest orders for fire hose ever written, 116,000 feet, has been awarded Goodrich by the City of Los Angeles, Calif., according to J. H. Connors, vice president and general manager of the Goodrich mechanical goods division. Goodrich has been manufacturing fire hose for more than 68 years; the product was one of the first made by the pioneer rubber company.

New "Oil-Pruf" Tire for Industrial Use

With the rapid development and wider uses of mechanized material handling equipment, there has been a marked increase in the use of rubber tires on trucks and trailers even under some hazardous conditions found in intra-plant hauling. In factories, steel mills, railroad and machine shops,

(*Continued on page 66*)

NEW JERSEY

WHILE most New Jersey rubber manufacturers report no improvement in business, a few find it a little better. Production of jar rings and hose will shortly stimulate trade. Orders for other mechanical goods show little, if any gain. A mild winter with little snow resulted in a cut of orders for rubber footwear.

Rubber Manufacturers Association of New Jersey held its annual meeting at the City Club, Trenton, at which A. Boyd Cornell, secretary and general manager of the Hamilton Rubber Mfg. Co., was elected president to succeed the late John A. Lambert. Officers reelected were vice president, Lloyd Leaver, Hamilton Rubber Mfg. Co.; secretary, Charles E. Stokes, Jr., Home Rubber Co.; treasurer, Horace B. Tobin, Woven Steel Hose & Rubber Co.

The Thermoid Co., Trenton, finds business is holding up fairly well, and the firm is operating without any layoff of help. The company will shortly resume manufacture in a new addition recently completed. Following the announcement by President Fred E. Schluter that his concern would not renew its agreement with the Rubber Workers of America, an effort is being made to have the employes affiliate with the new-formed Trenton unit of the Independent Rubber Employes Association. Milton Bozarth, president of the association, is conducting meetings for that purpose. The C.I.O. has appealed to the National Labor Relations Board for an election to establish its claim as sole bargaining agency here.

The Pocono Co., Trenton, filed a petition for bankruptcy under Section 77-B of the Bankruptcy Act on January 15, and on January 21 it was approved by the United States District Court. Vice President Wm. H. King was appointed trustee, and a hearing will be held later to determine whether the trusteeship shall be made permanent. Business continues uninterrupted.

Pierce-Roberts Rubber Co., Trenton, experiencing a further decline in business, has been compelled to lay off about 40% of its employes. A short time ago the concern was operating with three shifts. President Harry W. Roberts, accompanied by three other business men, is on an extensive motor trip through the South and will spend some time in St. Augustine, Fla.

Puritan Rubber Co., Trenton, reported business showed some improvement, with a larger January production than in December.

Near Para Rubber Co., Trenton, manufacturer of reclaimed rubber, announced that business dropped off considerably during the past two months.

Customer Service and Cooperation

For the purpose of displaying to the public, finished products fabricated from various materials supplied by E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., a showroom, instituted in April, 1916, on the Atlantic City, N. J., Boardwalk, has many times outgrown its original quarters. The initial space including 20 feet frontage and 2,200 square feet of interior space was increased in 1920 to nearly double the frontage with 60% additional floor space and in 1936 after 20 years of continuous usefulness, the size was enlarged to embrace a frontage of 54 feet and 6,000 square feet of floor area.

This permanent exhibit is a clearing-house of information regarding du Pont chemical products and their industrial uses. Instructive by nature, it enables visitors to visualize many modern industrial developments and learn of the processes employed in present-day manufacturing methods. For a time after the inception of this idea articles on display were occasionally sold, but this practice has long since been discontinued. Today the cooperation of du Pont customers, the manufacturers, is invited, and inquiries are either answered by the floor-staff or referred to manufacturers for their attention.

Window displays are usually changed each week to present various groups of products, included in which are many types of rubber merchandise. Because of the voluminous exposure through this exhibition, opportunity is afforded for the popularization of many new and useful articles. The accompanying photograph shows a recent exhibit of rubber soles, heels, and footwear together with the du Pont materials used therein.

Early Search for Artificial Rubber

W. J. Hamilton, of Carbondale, Pa., in a recent letter to *The New York Times* reported that when he was a student at Stevens Institute of Technology, Hoboken, N. J., about 1887-88 Dr. Thomas B. Stillman, then professor of analytic chemistry there, showed him the results of his attempts to find an artificial rubber. The substance he had produced, when first finished, gave promise of being a substitute for rubber, but deteriorated within a few weeks and, when shown, was a spongy mass in the process of disintegration.

Cyrus S. Ching, director of industrial and public relations, United States Rubber Products, Inc., 1790 Broadway, New York, N. Y., was a guest speaker at the twenty-sixth annual banquet of the New Jersey State Chamber of Commerce at Robert Treat Hotel, Newark, on February 9. He stated that the greatest prosperity this country has ever experienced waits upon cooperation of capital and labor.

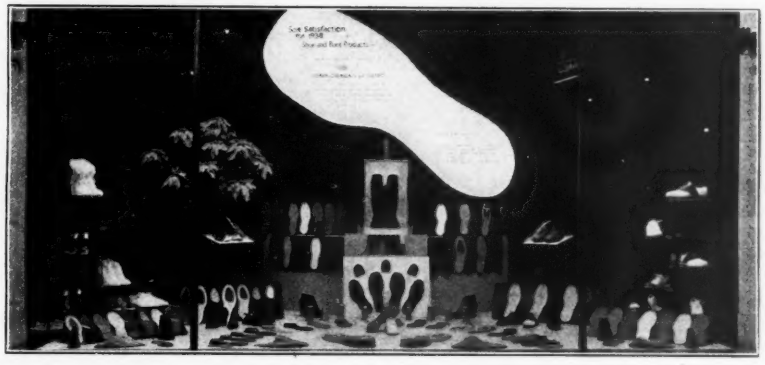
The Carter Bell Mfg. Co., supplier of rubber substitutes and chemicals, 150 Nassau St., New York, N. Y., has changed its factory post office from Millburn, N. J., to Springfield, N. J.

The Essex Rubber Co., and **Vulcan Recovery Co.,** both of Trenton, recently received a refund of $3,500 from the Bureau of Internal Revenue for overpaid taxes.

R. J. Goehrig, treasurer of Whitehead Bros. Rubber Co., Trenton, has been on a lengthy business trip through the South.

Acme Rubber Mfg. Co., Trenton, announced business was somewhat better than in the past month. President Horace T. Cook and his family have gone to Lake Wales, Fla., where they will remain until spring. Mr. Cook is also head of Hamilton Rubber Mfg. Co.

MacEwan & Smith Corp., recently incorporated to manufacture rubber articles at Woodbridge, N. J., has taken over the former plant of the Rubber Products Corp., Doylestown, Pa., which quit business some time ago.



Recent Window Display of Atlantic City du Pont Exhibit

MIDWEST

IN SOME sections of the Midwest last month definite improvement developed in some lines, although buying was conservative. Automobile production rose. Textiles, however, made a very poor showing, and it is believed this condition will remain until retailers have worked off excess inventories.

Julius A. Nieuwland Research Foundation

To honor the memory of one of her greatest sons and to perpetuate the scientific research which he inaugurated, the University of Notre Dame, Notre Dame, Ind., has established the Julius A. Nieuwland Memorial Foundation. The purpose is to continue projects instituted by Dr. Nieuwland and to seek other outlets for pure research. Dr. Nieuwland is best known to the industrial and scientific world as the man whose discoveries in the chemical field made possible the manufacture of synthetic rubber on a commercial basis.

In announcing the inauguration of the Nieuwland Memorial Foundation and inviting those interested to contribute to the fund being raised for this purpose, the Rev. John F. O'Hara, C. S. C., president of the University of Notre Dame, pointed out that synthetic rubber establishes an automatic control in the world market which reduces the monopoly price of raw materials and makes it feasible for the rubber industry in this country to continue to produce tires and similar products at a price which the general public can afford to pay.

President O'Hara says that the general benefit of society will be the aim of the university's research through this foundation. It is the hope of the university that the fund being raised for this purpose will ultimately reach a total of $990,000 to be allocated as follows: chair of organic chemistry, $125,000; visiting professors endowment, $125,000; five research fellowships (at $25,000 each) $125,000; lecture foundation endowment, $50,000; library and research materials fund, $75,000; and a new chemistry laboratory building, $500,000.

Chicago Rubber Clothing Co., Racine, Wis., has appointed as sales manager R. C. Freitag, for the past five years advertising manager of Amity Leather Products Co., West Bend, Wis.

The Midwest Hotel Show will hold its third winter exhibit at the Palmer House, Chicago, Ill., March 1 to 4, and every booth was sold long before the affair started. Included among the exhibitors are: Para Mfg. Co., Newark, N. J., shower curtains; Dunlop Tire & Rubber Co., Buffalo, N. Y., rubber mats; American Mat Corp., Toledo, O., and Wear Proof Mat Co., Chicago, rubber matting.

H. B. Spencer, manager of industrial and public relations, Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind., on February 15 addressed the local Kiwanis Club and showed the moving picture "The Romance of Rubber," devoted to rubber plantations.

OHIO

(*Continued from page* 64)

lathe cuttings and other sharp materials are often found on floors and runways, which accelerate the rate of normal tire wear due to load and abrasion.

When subjected to oils, ordinary tires disintegrate and become soft and spongy. Under such conditions they are susceptible to rapid tread wear, cutting, and chipping.

Goodrich, therefore, has introduced a new industrial tire, specially compounded to resist the action of animal, vegetable, and mineral oils, to be known as "Oil Pruf," according to Wilson C. Bray, manager of the truck and bus tire department.

"Tests carried on for several years in steel mills and meat packing companies prove that these new tires retain their original physical properties approximately 30% better than others tested when used in the presence of oils and other solutions usually classed as rubber solvents.

"By exhaustive tests a new and improved Universal compound has been developed which gives 10% better tread wear in normal service, and 65% better tread wear in service where cutting and abrasion are severe. Tear resistance has also been improved 10%, and the adhesion of the tread to the metal base is 35% better."

Mr. Bray further said that in addition to the Universal compound Roller and Novite industrial tire compounds have been developed with certain outstanding advantages for specialized services.

Rubber Expansion Joint Filler

Expansion joint fillers made of rubber are now being used for joint openings in concrete construction such as highways, curbs, sidewalks, and tanks. The fillers are formed into strips with a tubular opening through the center to allow for compression. Flexible lips on the two sides project upward against the concrete joint when in place, holding the strips securely. The strips are approximately 25% wider than the opening in which they are to be placed. Hence they are installed under compression, which permits the rubber to expand and contract with the concrete. The expansion of concrete in highways during hot weather causes bumps in the road when the joints are filled with tar. The use of rubber strip filler is said to overcome this disadvantage as the expansion and contraction is automatically taken up by the elasticity of the rubber. The B. F. Goodrich Co., Akron, O.

E. G. Holt, assistant chief, Leather and Rubber Division, Washington, D. C., was in Akron last month to address the Akron Export Club. He declared the world's armament race has been a super-salesman for the American rubber industry, for the preoccupation of foreign nations with the arms question has lessened competition abroad and opened up new markets. Thus rubber exports last year, 38% above the 1936 figure, reached the all-time record of $32,000,000 in value. Mr. Holt further believes America will always find world markets for some of her varied rubber products although the 1937 high may not be reached again for some time. Revised tariff schedules, moreover, have reduced imports from leading competitors of rubber products, notably Japan and Czechoslovakia. United States exports of rubber goods are well ahead of imports from other nations; thus in 1937 exports of rubber belting alone increased 60% over the 1936 figure. The government rubber expert also praised the International Rubber Regulation Committee for its work in raising the price of crude rubber by limiting export quotas. Mr. Holt also predicted a great expansion in the American rubber industry's home market, with exports between the low point of $16,000,000, in 1932 and the peak of 1937.

Pharis Tire & Rubber Co., Newark, last month rehired 100 employes, after a several weeks' layoff, to take care of increased orders for tires.

Toy Balloon Flight

Last Thanksgiving Day, Principal Paul Vaughan and pupil Carroll Dean, of a Glasgow, Ky., school, inflated a toy balloon with natural gas, tied to it a note with their names and a request for the finder to communicate with them, and then watched it disappear toward the south. It was found about two months later at Waterford, O., 300 miles north. Now they'd like to know how far south the balloon traveled before changing its course northward. *The Oak Leaf.*

BRAZIL

Official statistics for the first half of 1937 show that imports of pneumatic tires and tubes into Brazil came to 1,836 tons, value 18,705,000 milreis, considerably under the 2,376 tons, value 25,722,000 milreis, for the corresponding period of 1936, but higher than the totals for 1934 and 1935. Automobile imports have been increasing rapidly from 4,354 units in the first half of 1933 to 6,307 in 1934, 10,015 in 1935, 11,112 in 1936, and 14,986 in 1937. Crude rubber exports have gone up regularly since 1933; the shipments for the first half of that year were 3,735 tons, 5,408 tons for 1934, 5,821 tons for 1935, 6,604 tons for 1936, and 7,909 tons for 1937.

Rubber Industry in Europe

GREAT BRITAIN

Import and Export Figures

Crude rubber imports into Great Britain increased considerably in 1937 as compared with 1936; the respective figures are 3,052,119 centals of 100 pounds and 1,383,787 centals. At the same time scrap rubber imports rose from 48,089 to 118,940 centals.

Most exports showed substantial increases over those of the preceding year. Automobile tire exports were £3,099,584 against £2,500,304. Over 40% of the tires went to British countries; British India was the largest individual buyer. The value of tires exported to South Africa declined markedly, probably because of increasing tire manufacture there. Of the other countries, Denmark was the best customer and again increased her purchases, as did the Netherlands, which ranked second. Tire exports to the Argentine, after dropping about 10% in 1936 against 1935, made a considerable spurt from £71,358 to £115,344 in 1937.

Increases were also noted in the export business in insulated wire and cables, which advanced from £1,766,675 to £2,447,786 for all kinds; rubber and canvas belting for machines, from £231,460 to £363,254; rubber sheets and sheeting, from 21,962 cwt., value £239,018, to 23,343 cwt., value £249,596.

Exports of rubber-proofed apparel dropped steadily in the last three years, and in 1937 the value totaled £335,379, against £375,283 in 1936; this decrease was due to the progressive decline in business with European and other foreign countries, particularly Denmark and Netherlands; but exports to British countries, which took about 40% of the total of these goods in 1937, continued to advance. Similarly exports of footwear have been steadily decreasing and were 68,784 dozen pairs, value £111,532, in 1937, compared with 79,374 dozen pairs, value £121,444. Rubber footwear imports, however, have been rising just as regularly and came to 916,242 dozen pairs, value £1,137,888, against 801,462 dozen pairs, value £1,016,666, in 1936.

Scrap exports, at 653,916 centals, were more than double scrap exports of 1936.

Semtex Rubber Flooring

Semtex, Ltd., Steel House, Tothill St., London, S.W. 1., has been formed jointly by Dunlop Plantations, Ltd., and the Limmer & Trinidad Lake Asphalt Co., Ltd., with a capital of £10,000 in £1 shares, to promote and lay Semtex plastic rubber flooring. The board of directors consists of Chairman F. M. Bond and T. G. Marriott, both of the Limmer company, and F. D. Ascoli and L. V. Kenward, both of Dunlop.

No specific details are given as to the composition of the Semtex material other than that a specially stabilized rubber latex, supplied by Dunlop, is employed which preserves all the resilience of rubber in its natural state and serves to bind the other ingredients. Semtex plastic rubber flooring is mixed on the spot and applied cold in a plastic condition. Various grades are supplied for different applications, as flooring for general industrial purposes, ships' work, agricultural applications, etc.

Notes

Imperial Chemical Industries, Ltd., installed up-to-date laboratories for its dyestuffs group at Blackley, Manchester. This expansion became necessary as a result of the rapid growth of the company's activities in large-scale organic chemical research. Among the products of importance to rubber manufacture which have come from the Blackley laboratories recently are blue pigment "Monastral Fast Blue, B.S.," proofing agent Velan P.F., and synthetic plastic polymer Vulcaplas.

Richards, Boggs & King, Ltd., recently was formed in London with a capital of £3,000 in £1 shares, among other things to manufacture, import, and export Pliofilm and to manufacture and deal in goods or materials of all kinds made of Pliofilm or rubber. The first directors are James A. King, Harvey B. Richards, and Lionel B. Moses.

The British Army, as part of its new infantry equipment, now uses "Aero Boats." The rubber crafts, each carrying two men, are designed for crossing rivers.

The International Rubber Regulation Committee will hold its next meeting on Tuesday, March 29.

Edward V. Lane, London County Council, Bec School, Beechcroft Road, S.W.17, is collecting material for a biography of the late Sir Henry Wickham. If any of our readers can supply information on this subject, please communicate with Mr. Lane. Assisting him in this work are B. D. Porritt, director, The Research Association of British Rubber Manufacturers, and also the director of the Royal Botanic Gardens, Kew.

GERMANY

Government Decrees

In view of the government's desire for economy in the use of imported raw materials and its efforts to enforce widespread use of substitutes, former specifications as to quality of certain types of goods have been temporarily suspended where goods for home consumption are concerned. In these cases it is left to producers and consumers to agree among themselves as to the requirements the goods must meet. The government has also announced that prices for manufactured rubber goods made partly or wholly of synthetic rubber may be raised by the amount representing the difference between the price of synthetic and natural rubber.

At the end of last year the government initiated a drive to liquidate limited liability companies; subsequently a number of such firms, also in the rubber industry, have reorganized and become ordinary or special partnerships. Among these is Pahlsche Gummi-und Asbest Gesellschaft m.b.H., Dusseldorf-Rath, now known as Pahlsche Gummi-und Asbest Gesellschaft. Partners and managers are Drs. Heinrich and Hans Pahl.

New Processes

RECLAIMING. Remarkably good results are claimed for a recently patented reclaiming process[1] in which phosphatides dissolved either in oil or in water are added to ground old rubber, after which the mixture is heated in steam for about four hours at four atmospheres.

LATEX THREAD. When thread is produced by forcing latex through fine narrow nozzles into a coagulant, the threads are not always of uniform thickness because as soon as the latex leaves the nozzle and therefore is still in a fluid state, it is subjected to definite, if slight tension. This is avoided if the latex is forced through highly porous little porcelain tubes which are submerged in the coagulant as the latex passes through. These tubes are so porous that the coagulant can be forced through the walls under high pressure so that it coagulates the thread while it is still in the tubes. The interior diameter of the tubes corresponds to the desired thickness of the latex thread.[2]

[1] D.R.P. No. 654,217, for Lehmann, Voss & Co.

[2] D.R.P. No. 654,864, H. Ziegner, Hagen, Westphalia.

Crude Imports Up Again

Germany imported 901,759 quintals of crude rubber during the first 11 months of 1937, against 658,343 quintals in the corresponding period of 1936. Re-exports were only 1,643 against 4,669 quintals; so the quantity retained was 900,116, against 653,674 quintals.

Imports of manufactured rubber goods totaled 203,023 quintals, value 6,240,000 marks, against 19,481 quintals, value 3,441,000 marks. The remarkable 1937 figures are almost entirely due to heavy imports of old tires.

Exports declined somewhat in quantity during November, but the totals for 11 months increased from 146,748 quintals, value 36,260,000 marks, in 1936 to 173,483 quintals, value 43,529,000 marks in 1937.

Higher Latex Imports

German latex imports have increased monthly from 128.5 metric tons in June, 1937, to 475 metric tons in November.

Since the government has imposed import duties on latex which vary according to the concentration, the amounts of the imports at the different rates are entered separately. During the six months, June to and including November, 1937, the imports included 373.2 metric tons of latex containing up to and including 46% of rubber; 928.5 metric tons of 46 to 66% latex; 386.6 metric tons of 66 to 81% latex. The total comes to 1,688.3 metric tons, or 1,660 long tons, and places Germany third among latex consuming countries.

ITALY

Imports of crude rubber into Italy rose during the first 11 months of 1937 and showed a particularly steep advance during November. Exports of rubber manufactures also increased, but here the rise was largely due to shipments to Italy's colonies, which in the first 10 months of 1937 represented a value of 93,213,000 lire out of a total of 140,905,000 lire.

Home Rubber Supply. Efforts toward self-sufficiency in regard to rubber are continuing in Italy. The Economical & Financial Agency which last summer helped establish two organizations for studying and producing synthetic rubber, respectively, has now founded another society in conjunction with the Societa Italiana Pirelli, which is to cultivate guayule (*Parthenium argentatum*) and establish and finance companies to exploit the plant. The new enterprise, with headquarters in Rome, is known as SAIGA (Societa Anonima Industriala Gomma).

Tax Refund. The government recently decided to refund import duties and sales taxes on imported gasoline, kerosene, and mineral oil substitutes for turpentine where these products are used in the manufacture of rubber and asbestos goods and lacquers for export.

FRANCE

Societe generale des Etablissements Bergougnan reports a profit of 12,037,222 francs for the year ending September 30, 1937, against 6,152,975 francs for the preceding year. Including the carry forward from 1936, the sum of 14,103,669 francs (against 13,963,509 francs) is available. The dividend was increased from 35 to 40 francs per share.

Etablissements Fournier, Ostertag & Le Boulenger showed net profit of 1,377,260 francs for the year ended June 30, 1937, against 603,448 francs for the year before. The dividend was raised from 8 to 16 francs per share.

Societe Anonyme de Matieres Colorantes et Produits Chimiques de Saint-Denis announces three new products for the rubber industry: the accelerators VS (butyraldehyde-aniline) and GRE (derivative of mercaptobenzothiazol) and the antioxidant WBC. Accelerator GRE cures in the presence of small amounts of free sulphur (1.75%). The antioxidant is intended for light-colored mixes and for mixes cured with sulphur chloride.

HOLLAND

"The Fourteenth Annual Report of the Technical Division of the International Association for Rubber Cultivation in Netherland India" covers the period October 1, 1935, up to and including December 31, 1936. In connection with the establishment of the Rubber Foundation, the above division has been reorganized and work divided so that now a special Research Section at Delft handles the scientific problems and a Technical-Commercial Section, established temporarily at the Hague, handles the more general problems. Dr. A. van Rossem is at the head of the former, and J. E. Fol of the second.

Colloidal Clay. During the period under review valuable research work was carried out on the effect of colloidal clay on the properties of latex and latex mixes. Dr. van Rossem discussed the scientific findings in a paper read at the International Rubber Congress held at Paris, June 28-30, 1937.[1]

Latex Products. J. A. Plaizier, of the Research Section, made a satisfactory watertight cardboard by using latex flocculate and suitable fillers. G. van Nederveen, also of this section, made rubberized wagon covers which proved superior to oiled covers as regards impermeability to water, resistance to abrasion, weathering, creasing, ozone and light.

Rubber Roads. Several experimental road areas have recently been laid in which a mixture of asphalt and rubber powder was used for the topping. On the Naarden-Bussum road 7,190 square meters were thus treated. In addition the Hague Municipality approved the laying of similar areas of about 2,200 square meters in the Laan van Meerdervoort and 5,000 square meters on the Bezuidenhoutsche Weg, and a further area of 950 square meters on the Stationsweg where the rubber asphalt mixture was used not only for the top, but through the entire depth of the asphalt concrete bed.

Cord Inflammability. It was observed that latex-impregnated bicycle tire cord caught fire at 150° C. by spontaneous ignition; whereas the same type of cord impregnated with solution did not react in the same way. At first it was thought that pollution with metal was the cause, but this was proved not to be the case. Tests also indicated that the serum constituents in themselves could not be regarded as the cause of the phenomenon. When latex was evaporated, the rubber plasticized and then dissolved, and the cord impregnated with this solution, the phenomenon was not observed. It is held possible that the nature of impregnation is responsible for the tendency to spontaneous ignition in both latex and solution impregnated cord.

Michelin Tire Plant. It is reliably reported that Michelin will establish a tire factory in Den Bosch and that the N. V. Nederlandsche Bandenindustrie Michelin has been formed for this purpose. Michelin decided on this step to escape the high import duty on tires, which adversely affected sales.

Shock-Resistant Bakelite

To bridge the gap between phenolic molding material and laminated products, a process was developed to incorporate the advantageous features of both. Molding board having very high shock resistance is made by combining phenolic resin and fibers on paper-making equipment, followed by a sheeting process. Pieces cut from this molding board are positioned in the mold at the places to be reenforced. The regular molding material, either loose or preformed, is then added to the mold. As a result of this process, products can be produced with high shock resistance at crucial points.

Nonskid Floor Wax[1]

A nonskid, self-polishing floor wax, intended to prevent bad falls on waxed floors, consists of an emulsion of hard floor wax, an aqueous dispersion of vulcanized rubber, and an emulsifying agent. The rubber comprises 5 to 30% of the solid content of the suspension. The wax has been designed particularly for floors in large telegraph operating centers where messages are carried from room to room by "re-routing aides" on roller skates. The floors are usually heavily waxed to protect the floor surfaces against the action of the roller skate wheels. As ordinary wax is slippery, the skaters sometimes experience bad falls.

[1] See pp. 43-44 of this issue.

[1] U. S. patent No. 2,088,795, Aug. 3, 1937.

Rubber Industry in Far East

NETHERLAND INDIA

A.V.R.O.S. Report

Phosphates as Manure

An important development indicated in the director's report, for July 1, 1935, to December 31, 1936, of the General Experiment Station of the A.V.R.O.S. is the recognition of the value of suitable phosphates as manure especially on the poorer red soils in East Coast Sumatra. Hitherto the value of phosphates had seemed doubtful chiefly because in earlier tests insufficient quantities of less suitable forms (superphosphates) had been used. It has become more and more apparent that the older red soils are for the most part deficient in phosphates and that young rubber and ground covers especially, react in an unusually favorable manner to applications of phosphates; older trees are also benefited by such treatment. Advantage is being taken of these findings in the replanting of old and poor areas of red soil, which is now proceeding on a fairly extensive scale.

Manuring with phosphates at Soengei Pantjoer, the Hevea selection garden of the A.V.R.O.S., had a remarkable effect especially on the younger plots. This type of manure has also been applied on various plots of legitimate seedlings from crosses of various A.V.R.O.S. buddings. The seedlings had been planted in 1920-1924, and yields had been falling. An immediate improvement was noted in the foliage of the trees and the growth of the ground covers when phosphates were applied, and it is expected that yields will soon respond to this treatment.

Yields from Legitimate Seedlings

Records of average yields per tree per annum from the best of the abovementioned families of legitimate seedlings showed steady and satisfactory increases in most cases from the fifth until the tenth year, when outputs began to fluctuate sharply. Of four families indicated, only one, AV 166x161, showed a consistent rise in output beyond the tenth year; in this case the downward trend did not start until the thirteenth year after the average yield per tree per annum had reached 12.5 kilos, or 27½ pounds. In the fourteenth year it was down to 8.7 kilos, but recovered somewhat in the fifteenth year. The greatest variations were shown by the 157x161 family, whose yields rose rapidly to an average of 9.3 kilos in the ninth year, dropped to 7 kilos the next year, rose to 11.5 in the eleventh year, only to fall back to 6.8 kilos in the thirteenth year; by the fifteenth year it was up to 11.4 kilos again.

Curiously enough this family is one of two in this group showing good bark renewal and good secondary characteristics; whereas AV 166x161 is one of two families whose renewed bark showed a tendency to form ridges and knots.

Diseases

Various diseases of buddings were reported during the period under review, those affecting the tapping panel, as moldy rot, black stripe, patch canker, etc., requiring attention especially on estates in wet localities. One estate reported an unknown type of disease of the tapping panel which appeared to be practically confined to clone AV 52. Small round or oval patches, more or less rotten, formed from which latex exuded; at times the latex accumulated between the wood and the bark, forming nodules resembling lump canker. The cause of the disease could not be determined. Mites and *Oidium Heveae* again caused secondary leaf fall on some estates and in some cases the branches died.

Methods of Preparing Rubber

The latest available data concerning types of rubber produced and factory procedure, derived from the 1935 inquiry, indicate that of 203 factories which supplied information 112 produced sheet exclusively, 36 produced sheet and crepe, and 30 crepe alone. Sole crepe was produced by only 10 factories as against 26 the year before and 40 in 1930; one factory makes Revertex. Output of thin smoked sheet decreased from 30% to 26% of total No. 1 sheet. Sprayed rubber amounted to 2,800 tons. Bales were used to ship most of the sprayed rubber and 6,400 tons of other rubber, and about 1,300 tons of all grades were packed in mats.

The majority of the factories, that is 155, used only formic acid for coagulating; four used acetic acid; three both acetic and formic acid; two sodium silicofluoride; 22 a mixture of silicofluoride and formic acid; while three factories used sulphuric acid to a certain extent. It is interesting to note the change that has been taking place in regard to types of coagulant used. At one time acetic acid was almost the only coagulant permitted on well-regulated estates. Then it was almost entirely displaced by formic acid; while sodium silicofluoride gained some ground. The A.V.R.O.S. report covering factory practice in 1930 indicates that 164 factories used formic acid, 9 sodium silicofluoride, and only 3 acetic acid. The 1935 figures show some increase in the use of acetic acid, and a marked trend toward mixing sodium silicofluoride with formic acid instead of using the former alone.

November Exports

Exports from Netherland India have been falling of late. According to the Central Bureau of Statistics, rubber exported in November, 1937, totaled 29,612 metric tons, dry weight, against 34,986 tons in October. Java and Madura estates exported 6,419 metric tons, dry weight, including 7,936 kilos latex, besides 34,363 kilos in the form of tires. The latter shipments have been mounting in recent months, and the November figures represent an increase of over 100% as compared with those for the preceding month. Estates in Outer Provinces sent 12,203 metric tons against 13,704 tons the previous month.

Native rubber shipments were unusually low at 10,955 metric tons, against 14,564 tons the month before. In both months exports were so far below permissible that with the expected short-shipment for December, the year 1937 may actually close with native rubber showing a deficit. It is explained that part of this shortage in native rubber exports is due to the fact that conversion of export figures from wet rubber weight to dry equivalent had not taken place until November and that it had not been possible to take this correction into account when the export licenses were distributed in 1937.

MALAYA

Export Statistics

Domestic rubber exports from Malaya in December, 1937, are estimated at 50,000 tons, against the monthly export quota of 44,175 tons. At the end of November, 1937, Malaya had underexported 7,888 tons, including a deficit of 2,287 tons brought forward from 1936. The excess of 5,825 tons for December exports does not quite cover this deficit so that there still remains a shortage of 2,063 tons on shipments for the entire year.

The total shipments from Malaya in 1937 are put at 681,638 tons, value $485,017,000 (Straits currency), against 520,142 tons, value $303,315,000, in 1936.

In the first half of 1937 the colony experienced a mild boom which sent up prices for all kinds of goods and led to strikes for higher wages. The rubber industry found it had to pay con-

siderably more for estate supplies of all kinds and had to increase wages substantially. Although prices in the latter part of the year were much lower, some estates were still able to keep costs at little above the level of the preceding year, chiefly because the 90% release permitted large crops to be harvested and so cut tapping charges; improved machinery also led to greater efficiency and economy. Other estates, and these are in the majority, have been complaining that costs are disproportionate here in Malaya and that something must be done soon about the matter.

Estate News

Although the sharp increase was of short duration, it helped estates to recoup financially and to undertake necessary estate work. Manuring programs and replanting programs were initiated on more extensive scales than in the immediately preceding years, and several estates have installed modern equipment. The following abstracts provide instances of what the better prices have done for some rubber estates.

The Kapala Rubber Estates of Malaya has a planted area of 5,270 acres, and exportable crop including licenses purchased was 1,816,758 pounds for last year. In the current year 1,700 acres will be manured. During the business year just ended the factory was reorganized, modern continuous sheeter installed and latest style smoke houses built. The company paid a 10% dividend.

Sembilan Estates Co., Ltd., harvested a crop of 1,067,625 pounds, the higher exportable percentage made possible keeping production costs at only a little above that of the preceding year although wages and prices of materials had gone up. Manuring is proving beneficial; the trees are now healthier looking, and yields, too, have improved; consequently expenditure for this work will be continued. The budded area of 498 acres is not to be tapped until after the wintering season. The company declared a 12½% dividend

Pajam, Ltd., reports improved cash position. The crop harvested was 1,882,254 pounds and was obtained at an all-in cost of 14.05 cents (Straits currency) a pound. To maintain yields at their present high level the fertilizing program is to be continued and extended. It is proposed to build a new factory.

The company was able to pay interim and final dividends, which totaled 22½%.

CEYLON

Various small and simple articles of vulcanized rubber are now being made on a semi-commercial scale at the Dartonfield factory, F. T. E. O'Brien, director of the Rubber Research Scheme, Ceylon, stated recently. These include table mats cut from calendered sheet and vulcanized in an air chamber, rubber tubing, and squeegee rubber. Tests are also being made to use coir waste instead of wood flour as a compounding ingredient in products like floorings. A product of an entirely different class is a paint in which part of the linseed oil is replaced by a "solution of oxidized rubber in mineral spirit," in accordance with a patented process evolved by the Rubber Growers' Association. The rubber improves the brushing properties of the paint. At present prices for uncouponed rubber it is profitable to use rubber in the paint.

FAR EAST NOTES

The plan for Indo-China to continue participation in rubber restriction has been approved by the Syndicate of Rubber Planters who have nominated a special committee to represent the Syndicate in the negotiations for the renewal of the rubber control scheme when it expires the end of 1938.

Tunisia now requires an indication of origin on a long list of foreign (non-French) products including elastic fabrics and rubberized fabrics and clothing.

The Australian government will now grant freely import licenses, irrespective of country of origin, for various additional products including oil baize and fabrics similar to oil baize prepared with rubber, oil, celluloid, or nitrocellulose, and machines for working rubber.

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.†	Australia	Belgium	Canada	Czecho-slovakia	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1935	455,800	175,100	10,000	7,600	26,900	11,200	52,300	62,900	25,400	57,600	37,600	58,300	934,400
1936	475,361	62,676	14,423	9,627	27,867	8,772	56,777	71,793	15,998	61,701	30,967	64,647	831,148
1937													
Jan.	42,655	3,855	590	854	1,632	567	4,701	7,041	1,762	8,298	2,633	5,959	76,450
Feb.	44,398	6,081	331	1,363	1,271	837	5,276	7,911	1,477	6,605	3,048	5,068	77,363
Mar.	39,888	7,197	1,293	1,641	2,612	601	5,130	7,668	1,999	6,914	3,598	6,172	77,859
Apr.	42,066	9,871	1,058	1,069	1,343	1,445	5,302	8,664	1,589	5,808	1,532	5,843	79,527
May	48,506	8,488	1,287	2,113	4,187	925	5,619	6,706	2,745	8,597	1,886	6,244	94,915
June	48,972	10,437	2,258	1,630	3,790	1,150	6,022	6,469	1,745	7,608	3,940	6,127	94,868
July	43,018	13,854	1,959	851	1,946	754	4,315	7,860	2,662	4,869	2,150	5,865	86,877
Aug.	49,485	18,483	2,114	1,013	3,506	1,692	4,499	8,752	2,447	4,411	1,226	5,553	100,455
Sept.	56,685	16,654	3,104	1,258	2,396	1,369	4,830	10,595	1,941	3,671	1,391	5,578	108,489
Oct.	52,926	15,091	2,510	966	5,998	988	4,286	8,076	939	2,060	2,000*	5,457	98,104
Nov.	54,135	14,794	1,944	925	4,787	845	4,231	8,848	2,790	1,368	2,000*	4,928	99,679

*Estimate. †U.K. figures show gross imports, not net imports. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Shipments of Crude Rubber from Producing Countries

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Total	Philippines and Oceania	Africa	South America	Mexican Guayule	Grand Total
1935	417,000	282,900	54,300	9,100	4,900	8,900	19,300	28,300	28,700	853,400	1,500*	5,000	12,200	500	872,600
1936	353,667	309,630	49,685	8,648	5,859	8,177	21,013	34,578	40,769	832,026	1,619*	6,122	14,632	1,228	855,627
1937															
Jan.	24,746	27,048	4,514	487	579	1,234	4,015	3,849	2,823	69,295	80	635	1,286	160	71,456
Feb.	24,138	26,713	5,603	1,033	843	790	2,015	3,554	3,081	67,770	180	537	1,789	206	70,482
Mar.	40,138	40,645	7,049	885	1,149	1,239	1,425	3,873	3,160	99,563	181	472	1,792	136	102,144
Apr.	41,696	32,903	3,419	627	559	783	2,960	1,899	2,098	86,944	124	574	1,546	190	89,378
May	33,929	38,361	4,607	445	562	778	742	2,238	2,888	84,550	98	676	1,057	182	86,563
June	31,376	46,753	5,149	662	430	813	1,890	2,933	3,673	93,679	117	621	915	145	95,477
July	45,900	43,638	6,279	703	263	1,414	2,543	3,175	5,563	109,478	111	872	940	371	111,772
Aug.	43,284	40,485	7,308	471	134	1,189	1,624	2,999	2,277	99,771	187	726	1,314	335	102,333
Sept.	48,515	38,321	5,804	944	148	969	2,659	3,173	4,131	104,664	140	668	1,060	329	106,861
Oct.	47,586	34,416	6,701	994	254	1,505	523	2,352	3,753	98,084	99	708	1,533	247	100,671
Nov.	45,598	29,110	4,391	1,228	907	1,327	2,517	2,549	4,556	92,183	200*	600*	800	200*	93,983
Dec.	43,054	33,165	9,529	1,304	1,404	1,172	3,009	2,957	5,384	100,978	200*	600*	1,100*	200*	103,078

*Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Editor's Book Table

RUBBER BIBLIOGRAPHY

RUBBER INDUSTRY OUTLOOK. *Rubber Age (N. Y.)*, Feb., 1938, p. 317.

NEW CHEMICALS FOR INDUSTRY. *Chem. Ind.*, Feb., 1938, pp. 172-74.

RAW MATERIALS OF THE PLASTICS INDUSTRY. G. J. Esselen and F. S. Bacon, *Ind. Eng. Chem.*, Feb., 1938, pp. 125-30.

DEVELOPMENTS IN GRINDING. L. T. Work, *Ind. Eng. Chem.*, Feb., 1938, pp. 130-35.

ULTRAVIOLET MICROSCOPY OF HEVEA RUBBER LATEX. F. F. Lucas, *Ind. Eng. Chem.*, Feb., 1938, pp. 146-53.

COMPOSITION AND STRUCTURE OF HEVEA LATEX. A. R. Kemp, *Ind. Eng. Chem.*, Feb., 1938, pp. 154-58.

REDUCTION OF NOISE TRANSMITTED ALONG WATER PIPES. J. E. R. Constable, *Bull. Rubber Growers' Assocn.*, Jan., 1938, pp. 13-14.

RUBBER IN COMPRESSION. C. Macbeth, *Bull. Rubber Growers' Assocn.*, Jan., 1938, pp. 15-16.

THE AGRICULTURAL INDUSTRY IN AMERICA. A. Hay, *Bull. Rubber Growers' Assocn.*, Jan., 1938, pp. 17-23.

RUBBER AND ASBESTOS. *India Rubber J.*, Jan. 15, 1938, pp. 7-8.

THE PROPERTIES OF CEMENT-LATEX COMPOSITIONS FOR FLOORING. W. G. Wren, *Trans. Inst. Rubber Ind.*, Oct., 1937, pp. 189-229.

THE ACTIVATING INFLUENCE OF METALLIC OXIDES ON VULCANIZATION IN THE PRESENCE OF ORGANIC ACCELERATORS. F. H. Cotton and J. Westhead, *Trans. Inst. Rubber Ind.*, Oct., 1937, pp. 230-50.

VULCANIZATION OF RUBBER IN THE PRESENCE OF META-DINITROBENZENE. J. M. Wright and B. L. Davies, *Trans. Inst. Rubber Ind.*, Oct., 1937, pp. 251-66.

NATURAL AND SYNTHETIC RUBBER. XVIII. The Protein from Natural Rubber and Its Amino Acid Constituents. T. Midgley, Jr., A. L. Henne, and M. W. Renoll, *Rubber Chem. Tech.*, Jan., 1938, pp. 5-6.

RUBBER XVIII. Various Ozonides of Rubber and the Problem of the Existence of the Primary Ozonides of Harries. R. Pummerer and H. Richtzenhain, *Rubber Chem. Tech.*, Jan., 1938, pp. 7-31.

HIGHLY REACTIVE SULPHUR OR THE REACTION OF AMMONIA AND SULPHUR CHLORIDE IN RUBBER SOLUTIONS. F. B. Menadue, *Rubber Chem. Tech.*, Jan., 1938, pp. 92-96.

THE MECHANISM OF THE ACTION OF VULCANIZATION ACCELERATORS. Derivatives of Mercaptobenzothiazole. II. The Transformation of Mercaptobenzothiazyl Sulphide. O. A. Zeide and K. D. Petrov, *Rubber Chem. Tech.*, Jan., 1938, pp. 97-100.

RAPID DETECTION OF ACCELERATORS. E. P. Slepushkina. *Rubber Chem. Tech.*, Jan., 1938, pp. 210-13.

DEVELOPMENT OF HEAT RESISTANT CORD. R. B. Newton, *Rubber Age (N. Y.)*, Feb., 1938, pp. 311-12.

JOHNS CONVEYER SYSTEM. *Rubber Age (N. Y.)*, Feb., 1938, pp. 313-15.

TENSILE TESTS WITH FLAT (STRAIGHT) TEST-SPECIMENS. R. Ariano, *Rubber Chem. Tech.*, Jan., 1938, pp. 214-23.

THE INTERNATIONAL RUBBER REGULATION COMMITTEE AND ITS WORK. *Rubber Age (London)*, Feb., 1938, pp. 386-87.

HOW I.C.I. MEETS THE NEEDS OF INDUSTRIAL RESEARCH. *Rubber Age (London)*, Feb., 1938, pp. 388-90.

THE MARKING OF UNCURED RUBBER MIXES. H. J. Stern, *Rubber Age (London)*, Feb., 1938, pp. 391-92.

WETTING AND WETTING AGENTS. *Rubber Age (London)*, Feb., 1938, pp. 393-94.

DISCUSSION ON PIGMENTS. *Rubber Age (London)*, Feb., 1938, pp. 395, 398-99.

PLASTICS. Some Applications and Methods of Testing. T. S. Taylor, *India Rubber J.*, Jan. 22, 1938, pp. 9-12; Jan. 29, pp. 10, 12-14; Feb. 5, pp. 13-15.

RUBBER SUBSTITUTES. *India Rubber J.*, Jan. 29, 1938, pp. 17-18.

MICA AS FILLER FOR RUBBER AND PLASTICS. M. Deribere. *Caoutchouc & gutta-percha*, Dec. 15, 1937, pp. 356-57; Jan. 15, 1938, pp. 16-17.

SOLVENTS IN THE RUBBER INDUSTRY. F. Jacobs, *Rev. gén, caoutchouc*, Dec., 1937, pp. 20-28.

SWELLING MEASUREMENTS. J. Gleizes, *Rev. gén. caoutchouc*, Dec., 1937, pp. 3-8. (To be continued.)

DETERMINING TEARING RESISTANCE OF VULCANIZED RUBBER. D. J. van Wijk, *Kautschuk*, Jan., 1938, pp. 2-5.

EFFECT OF SOFTENERS ON LOADED MIXES. J. Behre, *Kautschuk*, Jan., 1938, pp. 6-12.

CALCULATION OF THE STABILITY OF RUBBER SOLUTIONS. M. Rachner, *Gummi-Ztg.*, Jan. 21, 1938, pp. 57-58.

SOME APPLICATIONS OF THE MICROSCOPE IN RUBBER TECHNOLOGY. *Gummi-Ztg.*, Jan. 28, 1938, pp. 80-81. (To be continued.)

WORK OF THE RESEARCH ASSOCIATION OF BRITISH RUBBER MANUFACTURERS. *India Rubber J.*, Feb. 12, 1938, pp. 6-8.

MODERN INSULATING MATERIALS FOR MODERN CARS. *Automotive Ind.*, Feb. 19, 1938, pp. 230-39.

PREPARATION AND TESTING OF LATEX COMPOUNDS. J. W. MacKay, *Ind. Eng. Chem.*, (Anal. Ed.), Feb. 15, 1938, pp. 57-59.

ELEVATOR PRECAUTION. Beware of falling objects when working in the shaft. Do not allow lumber, tools, or other things to drop into the shaftway.

BOOK REVIEWS

"Modern Rubber Chemistry." Harry Barron. Published by Chemical Publishing Co. of N. Y., Inc., 148 Lafayette St., New York, N. Y. Cloth, 5⅜ by 8½ inches, 342 pages. Illustrated. Author and subject index. Price $7.50.

In this comprehensive treatise the author presents the underlying scientific principles involved in the processing and study of rubber and latex. Mr. Barron has succeeded in his attempt to produce an easily readable work as outlined in the preface, "Although I have tried to be as factual as possible my primary intention is to be understood."

To cover a subject of such broad scope within the confines of this relatively small volume has imposed definite limitations on the treatment of the subject matter. However, through the elimination of involved and lengthy technical discussion, Mr. Barron has produced a book which should serve a definite purpose and prove valuable to new men in the industry as well as those who need a general knowledge of the principles involved without detailed information on any one subject.

To indicate the broad nature of the work it is only necessary to point out the headings of a few of the 25 chapters: "History of Rubber," "Latex," "Machinery and Processes," "Physical Properties of Rubber," "Chemical Properties of Rubber," "Compounding of Rubber," "Reclaimed Rubber," "Hard Rubber," and "Synthetic Rubber." The book contains 470 bibliographical references and 70 illustrations which include a number of photos of outstanding men in the industry.

"Pahang." Willard C. Bush. Published by The Macmillan Co., 60 Fifth Ave., New York, N. Y. 1938. Cloth, 5⅝ by 8⅜ inches, 284 pages. Price $2.50.

The setting for this novel is Pahang, the largest and probably the most primitive State of the Malay Peninsula. Narrating in the first person, the author describes the perils, conflicts, and temptations of his career as estate manager on rubber plantations. While there is little technical information disclosed relative to the production of rubber, the book does portray the vivid background scenes of human and animal life at the plantations. It is obvious that "Pahang" is to be read primarily as an adventure story, describing as it does repeated encounters with tigers, elephants, and other jungle animals. Combat with disease and unsanitation, as well as trouble with rebellious natives lends further excitement to the story. The melodramatic character of the book is magnified, possibly

to excess, by Mr. Bush's style of writing. Nevertheless, beneath the author's hair-raising escapades lies the more lasting impression of man's struggle for rubber, a conflict that has resulted in a historic drama of three continents.

"Receuil des Communications." Published by *Revue Générale du Caoutchouc*, Paris, France. 1937. Paper, 216 pages, 8½ by 10½ inches.

This complete collection of the papers read at the International Rubber Congress held in Paris, June 28-30, 1937, is divided into three groups: 11 papers coming under the head "Properties and Applications of Latex;" 19 under "Properties and Applications of Rubber;" and eight under "Synthetic Rubbers and Chemical Derivatives of Rubber." Whatever may be the opinion as to the value of the individual articles, the whole presents an impressive record of technical and scientific rubber research which invites speculation as to the new fields of application yet to be opened thereby.

What modifications in the qualities of rubber do such investigations promise, for instance, as those on the accelerating effect of latex serum on the polymerization of isoprene in the cells of the rubber plant ("Contributions to the Study of the Formation of Rubber in the Plant," by Otto Ambros); or those on the relation of the length of molecule chains and the regularity of chemical structure to the elasticity of natural and synthetic rubbers (Hermann Mark and E. Guth, "Statistical Theory of the Elasticity of Natural and Artificial Rubbers and of Analogous Substances Having the Form of Long Chains")? Will tire manufacture be affected by the fact that rayon can be completely impregnated with latex according to the Filastic process as suggested by M. Bongrand in the discussion following the reading of his paper on "Transmission and Conveyer Belting Obtained by Weaving Textiles Thoroughly Impregnated with Rubber"? Or to follow a different tack and refer to M. R. Thiollet's paper on "Applications of Auxiliary Products for the Natural Rubber Industry to the Artificial Rubber Industry:" What proportions will the development of artificial rubber assume and what effect is the difference in the requirements of compounding ingredients destined to have on the manufacture of chemicals for the rubber trade? And to close with a final query: What answers would a rubber congress held in, say 1950, have to show in regard to these questions?

MOTOR CAR OWNERS PAY A TOTAL annual tax bill of $1,320,000,000 on oil, gas, and license plates, according to an estimate by the League of Women Buyers and Taxpayers of the Nation, Inc. This is more than manufacturers get for new cars in a year.

NEW PUBLICATIONS

"The Thirty-Year Decline in Commodity Prices." Allen W. Rucker, The Eddy-Rucker-Nickels Co., Cambridge, Mass. 24 pages. The author of this booklet discusses long term trends of commodity prices and, through reference to statistics, points out that following the Napoleonic Wars and Civil War commodity prices declined for 30 years. Also, the trend has been downward for the past 18 years, the post-World-War period, and Mr. Rucker predicts that the decline will continue until approximately 1950, interrupted only by temporary upswings. It is further predicted that attempts to soften the impact of the declining price level through credit manipulation will ultimately result in a collapse of credit with its attendant political and social catastrophes. To avert this disaster, the author recommends a four-point program which, he believes, could cope with declining prices without wrecking the American economic and political system.

"Rubber Antioxidants — 'Santoflex B.'" Monsanto Chemical Co., Rubber Service Laboratories Division, Akron, O. 46 pages. After opening with a résumé of the specifications, properties, and uses of "Santoflex B," a Monsanto antioxidant, this booklet presents the results of physical tests which compare this material with other antioxidants in different-type stocks. The results include physical properties before and after aging. Results contained in the booklet cover tests on the following: comparison of antioxidants in a gum stock, low sulphur tube stock, first-grade tread stock, high-grade tread stock, and a high-grade tread stock with reduced sulphur; comparison of accelerators in a high-grade tread stock with "Santoflex B" as an antioxidant; and a comparison of competitive antioxidants in a high-grade tread stock.

"News about Du Pont Rubber Chemicals." E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. A news letter dated February 15 stated that reconstruction of the Neoprene plant, destroyed by the explosion of January 23, is expected to be completed by May 1. Changes in design will minimize the future explosion hazard, especially as it relates to continuity of Neoprene supply. However consumers are urged to limit their present use of Neoprene to purposes for which there is no possible substitute. Included with the news letter is one enclosure:

"The Limitations of Rubber. II. Influence of Light and Ozone." Alfred J. Northam. 20 pages. This report discusses the effect of compounding materials on sunlight resistance and points out how deterioration of rubber products may be reduced by the use of Heliozone. In conclusion the sunlight resistant quality of Neoprene compounds are considered. The report contains photographs which illustrate the effect of sunlight exposure on different compounds.

"Index to A.S.T.M. Standards and Tentative Standards." American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. 128 pages. In this publication the 823 Standards and Tentative Standards of the A.S.T.M. in effect as of January 1, 1938 have been indexed under appropriate keywords according to the materials or subjects to which they apply. As an added convenience, a list is given of the specifications and tests in numeric sequence of their serial designation. Copies of this index will be furnished without charge on written request to A.S.T.M. headquarters.

"Dyes and Other Synthetic Organic Chemicals in the United States, 1936." United States Tariff Commission, Washington, D. C. 98 pages. This report on the production and sales of dyes and other synthetic organic chemicals in the United States in 1936 includes detailed statistics for coal-tar crudes, intermediates, dyes, and all other coal-tar chemicals and for synthetic organic chemicals not of coal-tar origin. Synthetic rubber chemicals, production of which has increased rapidly in recent years, is shown in a separate table, divided into (a) those of coal-tar origin and (b) of non-coal-tar derivation.

"Paranite-G.O.P. Oil Loading Hose." The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J. Four pages. This bulletin explains the advantages of the Paranite-G.O.P. oil loading hose for suction or discharge service, or a combination of both. The bulletin, which is illustrated with installation and cross-section views, also contains information relative to the proper handling and care of oil loading hose.

"Catalog No. 226." Troester, Hannover-Wulfel, Germany. This catalog covers machinery for the rubber, cable, and celluloid industries and related fields. The volume, bound in stiff grey board, is about 8 by 10 inches and almost ¾-inch thick. It contains about 170 full-page plates printed on one side of the paper only. The first 24 pages show different mills, calenders, tubing and forcing machines, presses and pans for laboratory and experimental purposes. Then follows the regular factory equipment: mills for washing, grinding, refining and mixing; calenders; forcing machines for tubes, cables, and wires, for work both with natural and synthetic rubber; ertruders, strainers, tuber heads for all purposes; hydraulic presses and apparatus for flooring, belt-

ing, and all kinds of molded goods; machines for cutting insulating tape, rings, washers, etc., and also bale cutters; installations for impregnating fabric, insulating tape, thread, tire cord; and finally a variety of finishing devices and machine tools. Each machine is accompanied by a brief description in English, French, and Spanish, besides German. As this book was distributed for the first time on January 1, 1938, no new designs later than October 1, 1937, are included; however, a few machines of the types constructed before 1930 are so indicated. These have been added because they are still in demand overseas and also in small factories.

"The Housing Program versus Rent and Population Trends." Allen W. Rucker in collaboration with N. W. Pickering, President, Farrel-Birmingham Co., Inc., Ansonia, Conn. 16 pages. This publication, No. 25 in a series of booklet-editorials, discusses the Federal Housing Program which, in the opinion of the authors, ignores three fundamental factors: (1) the rise of building costs relative to rents; (2) the rapidly declining birth-rate of the nation; and (3) the distribution of child population in areas least able to afford new homes.

The authors state, "The Housing Program depends for its success upon stimulating building where fertility is highest and productivity is lowest; it revolves around a farcical attempt to undo in four years what has required natural forces four centuries to accomplish."

It is also pointed out that the low levels of housing in recent years are traceable not only to a reduction in the number of projects, but also in the average size and valuation per project. The authors believe that renewed activity in residential building will come only when labor and material costs are allowed to balance themselves with incomes and rents, but the supposition that construction can again reach the levels of the 1920's is based on a lack of knowledge of the fundamental situation.

"George Westinghouse Commemoration." Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. 80 pages. This book, reprinted from *Mechanical Engineering*, is based on the Westinghouse Commemoration held December 1, 1936, under the sponsorship of The American Society of Mechanical Engineers. The life history of George Westinghouse, the subject of this book, is also the story of an epic battle that brought electricity into 22,000,000 American homes and formed the foundation of a giant industry. The larger part of the book is devoted to the engineering achievements of Westinghouse, which are discussed under the following headings: The Air Brake, Alternating Current, The Steam Turbine, Railway Electrification, and Industrial Relations. Other sections of the book discuss: George Westinghouse, The Man, and Achievements of Westinghouse as Factors in Our Modern Life. Copies of this book will be sent to our readers on request to the Westinghouse company as long as the supply lasts.

United States Latex Imports

Year	Pounds	Value
1936	44,469,504	$6,659,899
1937	51,934,040	10,213,670
1937		
Jan.	2,995,027	535,546
Feb.	4,418,474	775,502
Mar.	4,962,915	968,053
Apr.	3,658,660	724,757
May	4,470,572	941,235
June	5,737,563	1,253,370
July	4,302,503	924,127
Aug.	4,033,306	838,778
Sept.	4,258,048	839,159
Oct.	4,384,892	844,205
Nov.	4,671,099	875,074
Dec.	4,040,981	694,164

Data from Leather and Rubber Division, United States Department of Commerce, Washington, D. C.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Trafalga Sq., London, W.C.2, England, gives the following figures for January, 1938:

Rubber Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	9,851	340
United States	20,302	330
Continent of Europe	12,109	388
British possessions	1,942	68
Japan	2,169	59
Other countries	427	1
Totals	46,800	1,186

Rubber Imports: Actual, by Land and Sea

From	Dry Rubber Tons	Wet Rubber (Dry Weight) Tons
Sumatra	5,441	627
Dutch Borneo	1,955	68
Java and other Dutch Islands	732	..
Sarawak	3,039	223
British Borneo	605	45
Burma	207	10
Siam	2,655	579
French Indo-China	595	158
Other countries	127	12
Totals	15,356	1,722

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Corduroy Rubber Co.	$3 Non-Cum. Pr. Pfd.	$2.00 irreg.	Dec. 20	Dec. 15
Faultless Rubber Co.	Com.	$0.50 q.	Apr. 1	Mar. 15
Firestone Tire & Rubber Co.	Pfd.	$1.50 q.	Mar. 1	Feb. 15
Goodyear Tire & Rubber Co.	Com.	$0.25	Mar. 15	Feb. 25
Goodyear Tire & Rubber Co.	$5 Conv. Pfd.	$1.25 q.	Mar. 15	Feb. 25
Hewitt Rubber Co.	Com.	$0.25	Mar. 9	Feb. 26
Lee Rubber & Tire Co.	Com.	$0.25 irreg.	Feb. 1	Jan. 15
Midwest Rubber Reclaim Co.	$4 Pfd.	$1.00 q.	Mar. 1	Feb. 18
Okonite Co.	Com.	$1.50	Feb. 1	Jan. 18
Okonite Co.	6% Pfd.	$1.50 q.	Mar. 1	Feb. 15
Philadelphia Insulated Wire Co.	Com.	$0.50 s.	Feb. 15	Feb. 1
Raybestos-Manhattan, Inc.	Com.	$0.37½	Mar. 15	Feb. 28
United Elastic Corp.	Com.	$0.10 irreg.	Mar. 24	Mar. 4
United Elastic Corp.	Com.	$0.10	Mar. 24	Mar. 4

Excise Tax on Rubber Tires

(Thousands of Dollars)

Year	Quarters: First	Second	Third	Months, Fourth Quarter: October	November	December	Total
1933	$2,107.8	$4,140.2	$8,181.9	$2,667.4	$1,466.7	$1,252.5	$19,816.5
1934	4,014.3	5,025.5	6,078.7	1,539.4	1,652.8	1,692.8	20,003.5
1935	4,699.5	5,921.7	6,117.9	1,890.2	2,659.9	1,371.7	22,660.9
1936	6,154.3	8,238.4	9,951.0	1,737.6	2,437.1	3,319.0	30,837.4
1937	8,418.0	8,176.8	9,128.1	2,953.2	1,676.4	3,147.6	33,500.2

Excise Tax on Inner Tubes

1933	$377.7	$809.1	$1,576.6	$589.8	$358.7	$307.6	$4,019.5
1934	968.9	1,222.2	1,426.0	382.3	403.9	299.2	4,700.5
1935	1,124.3	1,417.5	1,428.7	478.5	676.7	316.1	5,441.8
1936	1,237.0	1,638.5	2,022.4	343.3	492.8	670.0	6,404.0
1937	1,661.3	1,589.6	1,803.5	585.0	342.5	605.7	6,587.6

Source: Department of Commerce, Bureau of Foreign & Domestic Commerce, Washington, D. C. Rubber News Letter Circular No. 3,665.

Tire Production Statistics

Pneumatic Casings

	Inventory	Production	Shipments
1935	8,195,863	49,338,157	50,176,898
1936	11,114,399	58,116,349	55,362,739
1937	10,775,702	55,264,895	55,446,668
1937			
Jan.	11,377,015	4,980,174	4,509,240
Feb.	12,307,681	5,245,894	4,370,630
Mar.	12,448,167	5,915,575	5,787,051
Apr.	12,628,872	5,729,869	5,560,453
May	12,592,215	5,351,638	5,374,654
June	12,598,789	5,339,238	5,389,274
July	11,654,114	4,291,660	5,190,107
Aug.	10,812,835	4,049,057	4,930,273
Sept.	11,784,452	4,455,132	3,536,636
Oct.	11,643,709	3,980,149	3,940,399
Nov.	10,963,469	3,111,332	3,770,616
Dec.	10,775,702	2,952,177	3,153,402

Inner Tubes

	Inventory	Production	Shipments
1935	8,231,351	47,650,811	47,998,054
1936	10,985,273	57,247,553	54,624,321
1937	10,056,480	51,852,198	52,425,586
1937			
Jan.	11,100,094	4,801,186	4,390,960
Feb.	11,733,525	5,090,504	4,536,354
Mar.	11,904,354	5,822,646	5,570,705
Apr.	12,218,374	5,626,849	5,325,486
May	12,106,849	4,955,948	5,028,364
June	11,745,722	4,716,044	5,026,963
July	10,869,252	4,019,188	5,046,041
Aug.	10,144,264	4,129,468	4,852,494
Sept.	11,134,168	4,290,260	3,176,907
Oct.	11,102,575	3,718,944	3,518,199
Nov.	10,527,082	2,822,298	3,348,293
Dec.	10,056,480	2,349,086	2,875,009

Source: The Rubber Manufacturers Association, Inc. Figures adjusted to represent 100% of the industry.

Patents and Trade Marks

MACHINERY

United States

2,106,018. **Apparatus to Make Rubber Tubing.** P. A. Raiche, Providence, R. I., assignor to Davol Rubber Co.

2,106,442. **Buffing Apparatus.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,107,032. **Apparatus for Making Rubber Thread.** J. R. Gammeter, Akron, O., assignor, by mesne assignments, to U. S. Rubber Co., New York, N. Y.

2,107,735. **Crinkled Sheet Rubber Apparatus.** F. Honig, Pawtucket, R. I., asignor to United States Rubber Products, Inc., New York, N. Y.

Dominion of Canada

371,625. **Elastic Yarn Apparatus.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of F. D. Chittenden, Providence, and K. J. Rupprecht, Barrington, co-inventors, R. I.

371,794. **Core Coverer.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of United States Rubber Products, Inc., New York, N. Y., U. S. A., assignee of H. Z. Cobb, now deceased, of Providence, R. I., U. S. A.

371,798. **Mold.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. W. Oakleaf, Detroit, Mich., U. S. A.

United Kingdom

473,823. **Rubber Extruder.** United States Rubber Products, Inc.

473,825. **Tube Vulcanizer.** Soc. Italiana Pirelli.

473,872. **Gas Mask Mold.** Soc. Des Procedes Ecla.

473,899. **Vulcanizer.** A. H. Stevens. (Boston Woven Hose & Rubber Co.)

473,924. **Elastic Thread Knitter.** J. L. Getaz.

473,954. **Vulcanizer.** A. H. Stevens. (Boston Woven Hose & Rubber Co.)

474,594. **Glove Dipping Mold.** International Latex Processes, Ltd.

474,854. **Apparatus to Produce Sponge Rubber.** H. R. Minor.

Germany

656,033. **Rubber - covered Stretching Roll.** H. Wittler & Co., Brackwede.

656,041. **Vulcanizer for Retreading Tires.** K. Zangl, Munich.

656,068. **Tire Drum.** Deutsche Dunlop Gummi-Co., A.G., Hanau a.M.

656,327. **Vulcanizer to Renew Treads.** K. Zangl, Munich.

656,390. **Tire Pressure Gage.** A. Hauser, Oberursel, Taunus.

656,447. **Rubber Threads Extensibility Tester.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser and E. Salzer, both of Frankfurt a.M.

PROCESS

United States

2,105,567. **Jointing Cables.** J. K. Webb, Aldwych, London, England, assignor to International Standard Electric Corp., New York, N. Y.

2,105,746. **Golf Balls.** A. D. Macdonald, Malden, assignor to B. B. Chemical Co., Boston, both in Mass.

2,105,812. **Insulated Bead Wires.** J. T. Gordon and R. W. Snyder, both of Akron, O., assignors to Wingfoot Corp., Wilmington, Del.

2,106,048. **Coded Wire.** A. T. Candy, Jr., Oak Park, assignor to Candy & Co., Inc., Chicago, both in Ill.

2,106,137. **Carbon Black.** F. C. Reed, Kansas City, Mo.

2,106,792. **Vibration-Damped Structure.** D. S. Bruce, Somerville, and R. E. Berg, Plainfield, both in N. J., assignors to Johns-Manville Corp., New York, N. Y.

2,106,808. **Porous Rubber Sheets.** E. A. Murphy, Wylde Green, Birmingham, and S. D. Taylor, Sutton Coldfield, assignors to Dunlop Rubber Co., Ltd., London, all in England.

2,107,057. **Elastic Material.** S. W. Alderfer, assignor of one-half to E. D. Andrews, both of Akron, O.

2,107,078. **Stockings.** L. H. Mendelsohn, Paterson, N. J.

2,107,839. **Preparing Therapeutic Derivative of the Genus Lactuca.** G. Schenck, Ludwigshafen - on - the - Rhine, Germany, assignor to E. Bilhuber, Inc., Jersey City, N. J.

Dominion of Canada

371,319. **Cellular Rubber Structures.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. A. Murphy, G. W. Trobridge, and A. N. Ward, co-inventors, all of Birmingham, England.

371,352. **Moistureproof Pellicle Production.** E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., assignee of A. Hershberger, Kenmore, N. Y., both in the U. S. A.

371,676. **Electric Cables.** Societa Italiana Pirelli, assignee of L. Emanueli, both of Milan, Italy.

371,773. **Surgical Stockings.** United States Rubber Co., New York, assignee of P. Adamson, Rye, N. Y.

371,797. **Rubber Printing Plates.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of R. D. Gartrell, Oakland, N. J., U. S. A.

371,813, 371,814, and 371,815. **Sponge Rubber.** Industrial Process Corp., assignee of H. R. Minor, both of Dayton, O., U. S. A.

371,821. **Rubber Sheet Material.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. Hazell, New York, N. Y., H. C. Tingey, Nutley, and C. E. Linscott, Ridgewood, both in N. J., co-inventors, both in the U. S. A.

371,822. **Rubber Article Manufacture.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of J. J. Galligan, Providence, R. I., U. S. A.

371,823. **Elastic Fabric.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of M. C. Teague, Jackson Heights, N. Y., and T. G. Hawley, Jr., Naugatuck, Conn., co-inventors, U. S. A.

United Kingdom

472,764. **Electric Vulcanizing.** R. A. Dufour, and H. A. Leduc.

473,021. **Rubber Cored Yarns.** T. L. Shepherd.

473,937. **Treating Latex.** Semperit Oesterreichisch-Amerikanische Gummiwerke, A.G.

474,128. **Elastic Fabrics.** International Latex Processes, Ltd.

474,254. **Vulcanizing Latex.** H. J. Stern and J. W. Malden.

474,468. **Elastic Yarns and Fabrics.** Celloprene, Ltd., and M. Leon.

474,535. **Molding and Perforating Rubber Covered Rollers.** Stowe-Woodward, Inc.

474,597. **Preserving Rubber.** Musher Foundation, Inc.

474,651. **Creaming Latex.** Rubber Producers Research Association. (E. Rhodes and C. Sekaran.)

474,696. **Compound Sheet Materials.** British Celanese, Ltd.

474,881. **Microporous Battery Separators.** Chloride Electrical Storage Co., Ltd.

Germany

655,546. **Balls.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

655,722. **Porous Rubber from Latex.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and U. Pestalozza, Milan, Italy. Represented by R. and M. M. Wirth and C. Weihe, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

CHEMICAL

United States

2,105,768. **Chlorinated Rubber Composition.** W. E. Gloor, assignor to Hercules Powder Co., both of Wilmington, Del.

2,105,806. **Antioxidants.** A. M. Clifford, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.

2,105,808. **Vulcanizing Agent.** H. I. Cramer, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

2,105,825. **Plastic Composition.** C. H. Smith, Tallmadge, O., assignor to Wingfoot Corp., Wilmington, Del.

2,106,519. **Colored Lacquers.** A. Conzetti, assignor to J. R. Geigy, A.G., both of Basel, Switzerland.

2,107,511. **Waterproof Coating.** C. E. Spooner, Arkansas City, Kan.

Dominion of Canada

371,472. **Antioxidant.** B. F. Goodrich Co., New York, N. Y., assignee of P. C. Jones, Akron, O., U. S. A.

371,626. **Antioxidant.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of L. H. Howland, Nutley, N. J., U. S. A.

371,761. **Electrical Insulation.** Canadian Industries, Ltd., Montreal, P. Q., assignee of I. Williams, Carneys Point, N. J., U. S. A.

371,796. **Accelerators.** Dominion Rub-

ber Co., Ltd., Montreal, P. Q., assignee of W. E. Messer, Cheshire, Conn., U. S. A.

371,828. **Latex Sponge Compositions.** Mishawaka Rubber & Woolen Mfg. Co., assignee of G. W. Blair and J. F. Schott, all of Mishawaka, and C. E. Bradley, South Bend, co-inventors, all in Ind., U. S. A.

371,850 and 371,851. **Antioxidant.** Wingfoot Corp., Wilmington, Del., assignee of W. Scott, Akron, O.

United Kingdom

473,651. **Hydrogenated and Cracked Hydrocarbons.** Gewerkschaft Auguste.

473,976. **Latex Adhesives.** H. Broomfield and Shoe Inventions, Ltd.

474,064. **Corrosion-Resistant Coating Composition.** Drake, McGee & Hallsted, Inc.

474,189. **Accelerators.** Wingfoot Corp.

474,841. **Transparent Rubber Hydrohalides.** Margon Corp.

475,132. **Dispersing and Emulsifying Agents.** E. I. du Pont de Nemours & Co., Inc.

475,162. **Resin and Synthetic Rubber Latices.** Chemische Forschungsges.

475,220, 475,221, and 475,453. **Accelerators.** Wingfoot Corp.

475,552. **Polymerized Vinyl Compounds.** F. B. Dehn. (Röhm & Haas A.G.).

475,598. **Rubber-Like Products from Drying Oils.** H. G. Kittredge.

Germany

654,467 and 654,527. **Accelerator.** I. G. Farbenindustrie A.G., Frankfurt a.M.

655,351. **Elastic, Homogeneous Bituminous Coats Containing Rubber.** Chemieprodukte Komm. Ges., Berlin-Britz.

GENERAL

United States

2,105,462. **Ball Swinging Toy.** A. Brinkman, Milwaukee, Wis.

2,105,465. **Cord Connecter Body.** E. F. Bannon, assignor to H. Hubbell, Inc., both of Bridgeport, Conn.

2,105,480. **Safety Belt.** E. L. Hoffman, Montgomery, Ala.

2,105,647. **Shoe.** T. Gutwein, Dayton, O.

2,105,725. **Bandage Binder Clip.** E. Freiberg, Brooklyn, N. Y.

2,105,738. **Tire Pressure Indicator.** G. F. Hutchings, St. Louis, Mo.

2,105,795. **Container Conveyer.** I. H. Risser, assignor to U. S. Bottlers Machinery Co., both of Chicago, Ill.

2,105,800. **Subirrigation Device.** W. E. Watkins, Hemet, Calif.

2,105,810. **Doll Head.** F. Fenton and H. M. Dodge, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,105,833. **Continuous Outlet System.** S. R. Feuer, H. Freedman, H. Hozinsky and A. Balbinder, all of Brooklyn, N. Y.

2,105,859 and 2,105,860. **Tire.** J. J. Hruska, Wilwaukee, Wis.

2,105,908 and 2,105,909. **Suspender.** J. W. Dick, Alberta, Canada.

2,105,957. **Liquid Dispensing Device.** A. N. Severson, Milwaukee, Wis.

2,105,987. **Knitted Fabric.** J. P. Primm, Rome, Ga.

2,105,997. **Cushion.** F. O. Church, assignor to Dunlop Tire & Rubber Corp., both of Buffalo, N. Y.

2,106,021. **Garment.** C. H. Schopbach, assignor to International Corset Co., both of Aurora, Ill.

2,106,060. **Cable.** J. K. Ostrander, Philadelphia, Pa.

2,106,157. **Gold Mining Machinery.** R. G. Neider, assignor to Submarine Gold Mining Co., Boise, Idaho.

2,106,322. **Weatherproofing Structure.** D. H. Harnly, Chicago, Ill.

2,106,324. **Wiring Device.** R. R. Keesee, Prattsville, Ark.

2,106,334. **Trousers.** S. Adamson, Larchmont, assignor to United States Rubber Products, Inc., New York, both in N. Y.

2,106,344. **Electrical Device.** J. R. Flegal, New York, N. Y., and N. Y. Priessman, Wyoming, N. J., assignors to Bell Telephone Laboratories, Inc., New York, N. Y.

2,106,348. **Static Resisting Garment.** S. S. and J. B. Hall, assignors to Surety Rubber Co., Carrollton, O.

2,106,385. **Shim Structure.** R. W. Springer, Detroit, Mich.

2,106,532. **Apparatus for Separating Gravel.** A. M. Lockett, New Orleans, and H. H. Holloway, Amite, La.

2,106,553. **Drop Seat Garment.** J. H. Le Coney, Bedford, assignor to Earnshaw Knitting Co., Newton, both in Mass.

2,106,569. **Brassiere.** S. Leffmann, London, England, assignor to Kops Bros., Inc., New York, N. Y.

2,106,604. **Resistor.** C. A. Jagger, Schenectady, N. Y., assignor to General Electric Co.

2,106,638. **Valve Stem.** R. E. Hillier, Akron, O., assignor to F. H. Watson Co., Jonesboro, Ark.

2,106,640. **Sandwich Wrapper.** A. Kovalik, Pittsburgh, Pa.

2,106,667. **Electric Insulator Mounting.** L. Thiry, Huy, Belgium.

2,106,671. **Valve Stem.** F. H. Watson, Jonesboro, Ark.

2,106,673. **Tire and Valve Stem.** L. C. Broecker, assignor to Bridgeport Brass Co., both of Bridgeport, Conn.

2,106,701. **Apparatus for Coating Molds.** D. J. Campbell and A. G. Anderson, assignors to Campbell, Wyant & Cannon Foundry Co., all of Muskegon Heights, Mich.

2,106,704. **Golf Ball.** H. K. B. Davis, Springfield, Mass.

2,106,723. **Valve.** R. W. Collison, Takoma Park, Md.

2,106,791. **Resilient Diaphragm.** L. C. Brisson, Neuilly-sur-Seine, assignor to Societe Anonyme: Societe des Freins Hydrauliques S. de Lavaud, Paris, both in France.

2,106,795. **Respirator.** H. S. Cover, South Bend, Ind.

2,106,817. **Sealing Gasket.** K. J. Soule, Ridgewood, assignor to Raybestos-Manhattan, Inc., Passaic, N. J.

2,106,840. **Refrigerating Apparatus.** R. E. Gould, assignor to General Motors Corp., both of Dayton, O.

2,106,867. **Laminated Material.** C. V. Brady, Webster Groves, assignor to Bemis Bros. Bag Co., St. Louis, both in Mo.

2,106,943. **Composition Material.** A. C. Fischer, Chicago, Ill.

2,107,013. **Belt.** D. F. Morgan, Oak Park, assignor to Nucord Co., Chicago, both in Ill.

2,107,018. **Collapsible Form.** J. C. H. Wendes, Naugatuck, Conn., assignor to United States Rubber Products, Inc., New York, N. Y.

2,107,109. **Water Bubbler.** A. J. Desrosiers, New Bedford, Mass.

2,107,121. **Foundation Garment.** W. Kops, assignor to Kops Bros., Inc., both of New York, N. Y.

2,107,136. **Fan.** L. Zaiger, Lynn, Mass.

2,107,167. **Bottle Closure.** M. Sierad, assignor to G. W. Button Corp., both of New York, N. Y.

2,107,204. **Molded Knob.** K. W. Macksey, Montclair, assignor to Mack Molding Co., Wayne, both in N. J.

2,107,226. **Tube Cap.** S. R. Weston, Montreal, P. Q., Canada.

2,107,227. **Dry Cleaner.** C. K. Woodin, Bloomington, Ill., assignor to National Rubber Machinery Co., Akron, O.

2,107,337. **Girdle.** M. G. Moore, St. Paul, Minn.

2,107,362. **Reflector.** C. V. Bergstrom, Milwaukee, Wis.

2,107,421. **Curtain Holder.** F. L. Lennox, Ann Arbor, Mich.

2,107,490. **Tractor Track.** R. Mayne, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,107,512. **Means to Lay-in Elastic Strand in Edge of Mesh Fabric.** J. Steinberg, New York, N. Y.

2,107,619. **Tie Knot Device.** J. F. Ramas, Chatou, France.

2,107,636. **Cleanser Device.** R. B. Kingman, Orange, assignor to Metal Textile Corp., W. Orange, N. J.

2,107,666. **Foam Apparatus.** H. Hechman, New York, N. Y.

2,107,695. **Belt Package.** R. E. S. Geare, assignor to L. H. Gilmer Co., both of Philadelphia, Pa.

2,107,822. **Roller Conveyer.** A. M. Hahn, Washington, D. C., assignor to Mathews Conveyer Co., Ellwood City, Pa.

2,107,849. **Girdle.** M. Bienenfeld, Brooklyn, N. Y.

2,107,912. **Tire Deflater.** K. A. Spieth, Kearney, Neb.

2,107,939. **Plug.** J. C. Hartnack, assignor to Rubbercraft Corp. of Calif., Ltd., both of Los Angeles, Calif.

Dominion of Canada

371,312. **Garment.** Earnshaw Knitting Co., Newton, assignee of J. H. LeConey, Bedford, Mass., U. S. A.

371,354. **Catamenial Receptacle.** M. Lewis, assignee of J. R. Manegold, both of Milwaukee, Wis., U. S. A.

371,365. **Automobile Shackle.** A. J. Borst, Jr., Eggertsville, N. Y., U. S. A.

371,395. **Garment.** A. Simpson, London, England.

371,401. **Foundation Garment.** C. Brown, New York, N. Y., U. S. A.

371,467. **Power Driving Belt.** Dayton Rubber Mfg. Co., assignee of A. L. Freedlander, Dayton, O., U. S. A.

371,471. **Acid Container.** General Tire & Rubber Co., assignee of H. T. Kraft, both of Akron, O., U. S. A.

371,528. **Visor Panel.** Woodall Industries, Inc., assignee of F. L. Chadwick, both of Detroit, Mich., U. S. A.

371,556. **Bathing Suit.** A. M. Hansen, Hammerum, Jylland, Denmark.

371,560. **Tire Pressure Operated Switch.** C. W. Johnson, Newark, N. J., U. S. A.

371,591. **Fastener for Rubber.** H. Evesmith, Fargo, N. D.

371,619. **Outing Garment.** Churchill Clothing Mfg. Co. Reg'd, assignee of J. L. Perrault, both of Coaticook, P. Q.

371,627. **Sandblasting Apparatus.** Dunlop Rubber Co., Ltd., London, assignee of H. Willshaw, Erdington, Birmingham, both in England.

371,682. **Roll.** Stowe-Woodward, Inc., assignee of R. J. Wilkie, both of Newton, Mass., U. S. A.
371,788. **Retrigerator Cabinet.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of G. F. Forsthoefel, Springfield, Mass., U. S. A.
371,795. **Asbestos Yarn.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of B. H. Foster, Maplewood, N. J., U. S. A.
371,368. **Sanitary Cover.** F. H. Bimrose, Dillon, Mont., U. S. A.

United Kingdom

472,577. **Bottle Closures.** T. Schroder-Nielsen.
472,864. **Hair Curling Appliances.** H. Engelke.
472,978. **Bottle Capping Apparatus.** A. J. Marek, A. H. Smith, and S. A. Screeton.
473,027. **Spring Upholstery.** A. Henderson.
473,047. **Seats.** L. Renault.
473,069. **Fabrics.** Heberlein & Co., A.G., G. Heberlein, and E. Weiss.
473,085. **Money Boxes.** J. Brighouse.
473,113. **Stenciling Apparatus.** Turner Tanning Machinery Co., Ltd. (Turner Tanning Machinery Co.)
473,135. **Tuft Yarn Tubes.** J. H. Dutfield.
473,199. **Pails.** E. Fiedler.
473,253. **Centrifugal Pumps.** International Combustion, Ltd., and W. F. Harlow.
473,535. **Flexible Tubes.** Metallschlauch-Fabrik Pforzheim Vorm. H. Witzenmann Ges. and F. Roemer.
473,596. **Couplings.** G. E. Stanley.
473,608. **Arch Supports.** R. Mercer. (Scholl Mfg. Co., Inc.)
473,747. **Foot Supports.** H. G. Brosten and O. E. Kenth.
473,764. **Confectionery Mold.** J. Weyreuter.
473,767. **Umbrellas.** G. F. Eeles.
473,785. **Bathing Caps.** W. K. Naundorf.
473,788. **Punching Balls.** A. Bossini and G. G. Gherardi.
473,792. **Discharge Apparatus.** British Thomson-Houston Co., Ltd.
473,816. **Mats.** J. Siemss.
473,832. **Cables.** Allgemeine Elektricitats-Ges.
473,848. **Railway Vehicle Undercarriages.** P. Algrain.
473,851. **Apparatus for Making Cartons.** M. C. Ritchie, and M. C. Ritchie, Ltd.
473,861. **Soles.** R. Ashworth.
473,891. **Surgical Pads.** G. W. T. Leeson.
473,908. **Springs.** International Latex Processes, Ltd., E. A. Murphy, G. W. Trobridge, and A. N. Ward.
473,912. **Gill Boxes.** P. J. Gillespie.
473,956. **Hinges.** Getefo Ges. Fur Technischen Fortschritt.
473,957. **Compound Sheet Materials.** Continental Gummi-Werke A.G.
474,054. **Combined Conductor and Wire Rope.** W. T. Wells.
474,063. **Condensers.** Mallory Patents Holding Co., Ltd.
474,071. **Soles and Heels.** B. T. Hewson.
474,106. **Swimming Suits.** F. Warner.
474,107. **Moldings.** J. M. Strabolgi, Lord Kenworthy, and F. M. Cumberland.
474,108. **Cables.** Rockbestos Products Corp.
474,110. **Rubber Bonded Abrasive Wheels.** Norton Grinding Wheel Co., Ltd.
474,116. **Cables.** Felten & Guilleaume Carlswerk A.G.
474,151. **Batteries.** F. MacCallum and A. H. Redfern.
474,168. **Traffic Signals.** G. F. Whipple.
474,183. **Piezo Electric Crystal Mountings.** Marconi's Wireless Telegraph Co., Ltd.
474,198. **Vehicle Collision Guards.** British Motor Boat Mtg. Co., Ltd., and C. H. Harrison.
474,283. **Shock Absorbers.** H. Smith.
474,339 and 474,340. **Grinding Wheels.** Norton Grinding Wheel Co., Ltd.
474,447. **Compound Fabrics.** A. G. Sladdin.
474,451. **Machine to Remove Shoes from Lasts.** British United Shoe Machinery Co., Ltd. (United Shoe Machinery Corp.)
474,488. **Coated Fabrics.** Vereenigd Industrieel Bezit Veritex N. V.
474,511. **Percussive Drills.** R. Bosch, A.G.
474,516. **Toys.** Rheinische Gummi-Und Celluloid-Fabrik.
474,534. **Centrifugal Machines.** J. S. Pecker.
474,596. **Coating Apparatus.** P. J. Massey and Consolidated Water Power & Paper Co.
474,644. **Cables.** British Thomson-Houston Co., Ltd
474,761. **Toys.** F. F. Hofstotter.
474,785. **Rubber Sheets.** A. G. Barrett and John Bull Rubber Co., Ltd.
474,850. **Rollers.** F. Von Heinrich.
474,888. **Head Treatment Appliances.** Crosley Radio Corp
474,894. **Paper Punching Machines.** G. W. French, and Beasley, French & Co., Ltd.
474,993. **Fishing Net Floats.** Tuck & Co., Ltd., and H. Jackson.
475,138. **Underclearer Rollers for Preparing Machines.** A. S. Lowry.

Germany

655,166. **Packing and Insulation Sheet.** Norddeutsche Asbest-und Gummiwerke Kurt Webert & Co., G.m.b.H., Wandsbek.
655,270. **Tire.** C. T. Pastor, Krefeld-Traar.
655,457. **Respiratory Mask.** Dragerwerk Heinr. and Bernh. Drager, Lubeck.
655,499. **Tire.** Deutsche Dunlop Gummi-Co., A.G., Hanau a.M.
655,500. **Protective Tire Insert.** R. Hilprecht, Berlin.
655,961. **Tire.** Deutsche Dunlop Gummi-Co., A.G., Hanau a.M.
655,988. **Perforated Polisher Containing Rubber.** Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt a.M.
656,079. **Tire.** B. von Loutzkoy, Berlin.
656,080. **Tire Tread.** United States Rubber Products, Inc., New York, N. Y., U. S. A. Represented by W. Harmsen, Berlin.

TRADE MARKS

United States

353,731. Label containing representation of two fish diving into the water and the words: **"Water Wear"** underneath. Beach wear and girdles. United States Rubber Products, Inc., New York, N. Y.
353,737. **Condo.** Footwear. Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.
353,744. **Tummy-In.** Girdles. Undi-Klad Mfg. Co., Chicago, Ill.
353,745. **Merry Go Round.** Baby pants. American Latex Corp., New York, N. Y.
353,759. **Allo.** Brassieres, corsets, garter belts, etc. Maiden Form Brassiere Co., Inc., New York, N. Y.
353,791. **Fisher Splashgon.** Filter attachment. Fisher Scientific Co., Pittsburgh, Pa.
353,797. Shield containing the word: **"Pioneer."** Suspenders, garters, etc. Pioneer Suspender Co., Philadelphia, Pa.
353,819. Representation of a jar ring. Jar rings. Crown Cork & Seal Co., Inc., Baltimore, Md.
353,841. **Camera Girl.** Brassieres, corsets, girdles, etc. Neatform Co., Inc., New York, N. Y.
353,842. **Picture Girl.** Brassieres, corsets, girdles, etc. Neatform Co., Inc., New York, N. Y.
353,843. **Tingle.** Brassieres, corsets, girdles, etc. Neatform Co., Inc., New York, N. Y.
353,896. **Harry Cotler.** Suspenders, garters, etc. Harry Cotler, New York, N. Y.
353,964. Representation of a man holding a sign containing the words: **"You Are My Prospect When You Drive Through Sleet Without a Sleet King Defroster. I. C. Sleet Undertaker's Helper."** Windshield wipers. Sleetex Co., Inc., New York, N. Y.
354,071. **EA.** Windshield wipers. E A. Laboratories, Inc., Brooklyn, N. Y.
354,073. **Fondé Youth.** Corsets, brassieres, and girdles. Classic Foundations, Inc., New York, N. Y.
354,126. **Nan-At-Ease.** Corsets and brassieres. Garfinkel & Ritter, New York, N. Y.
354,164. **K-28.** Golf balls. General Sports, Inc., Chicago, Ill.
354,210. **Bias-lastik.** Corsets. Franco Corset Co., New York, N. Y.
354,219. Representation of a pennant with a circle at one end containing the letters: **"OTCo"** with an eagle over the "T" and the word: **"Champion."** Elastic hosiery, abdominal belts, trusses, etc. Ohio Truss Co., Cincinnati, O.
354,225. **Herold.** Combs. New York Hamburger Gummi-Waaren Co., Hamburg, Germany.
354,234. Representation of a carton containing the words: **"Double Duty"** thrice. Inner tubes. Burke-Savage Tire Co., Baltimore, Md.
354,255. **Life-Belt.** Tires and tubes. Pharis Tire & Rubber Co., Newark, O.
354,297. Label containing representation of a woman with dress shields and the words: **"Lady Dainty."** Dress shields. J. Stein, doing business as Climax Rubber Co., Brooklyn, N. Y.
354,338. **Midclean.** Liquid neutral cleaner for rubber floors. Midland Chemical Laboratories, Inc., Dubuque, Iowa.
354,367. **Ruralay.** Wires and cables. General Cable Corp., New York, N. Y.
354,373. **Neillo.** Catamenial belts. F. W. O'Neill, Beverly Hills, Calif.
354,396. **Standard Gum-Dipped.** Tires. Firestone Tire & Rubber Co., Akron, O.
354,397. **Pullman.** Tube repair kit. Pullman Chemical Co., Camden, N. J.
354,410. **Daytonian.** Tires. Dayton Rubber Mfg. Co., Dayton, O.
354,416. **Sterling Means Quality.** Packings and gaskets. Sterling Packing & Gasket Co., Inc., Houston, Tex.

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

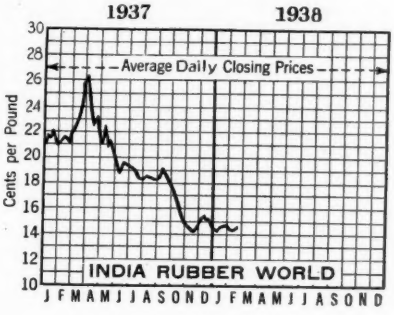
Futures	Jan. 1	Jan. 29	Feb. 5	Feb. 12	Feb. 19
Jan.	14.54	.....	.....	.....	.....
Feb.	.....	14.49	14.34	14.37	14.82
Mar.	14.68	14.57	14.42	14.45	14.90
July	14.85	14.82	14.71	14.77	15.20
Sept.	14.95	14.95	14.81	14.88	15.30
Dec.	.....	15.10	14.97	15.03	15.41
Jan.	.....	.....	15.02	15.14	15.46
Volume per week (tons)	13,710	18,110	8,560	7,730	20,320

THE Commodity Exchange table published here shows prices of representative future contracts on the New York market the past two months.

On January 29, July futures sold at 14.82¢ per pound. With trading quiet, the price fell off to 14.42¢ per pound on February 5. Prices rallied with inflationary implications coming from Washington, and July futures moved up to close at 15.09¢ per pound on February 26. During the past four weeks the maximum variation in prices for delivery during the next year was 0.77¢ per pound. Trading was inactive during the early part of February, but passed 20,000 tons during the week ending February 19 when the market was rising.

Rubber consumption in this country failed to show any improvement in January over the December figures. The rubber market was not influenced by this unfavorable report, as the figures had been previously anticipated. With this low consumption, the sharp decrease in January imports was not sufficient to reverse the trend in domestic rubber stocks, which were again increased.

United States imports of rubber established a new all-time high in 1937 at 600,476 long tons, according to figures released by the Bureau of Foreign and Domestic Commerce. The nearest previous approaches to this figure were in 1929 (565,087 tons) and in 1931 (501,851 tons). The value of rubber imports in 1937 was $248,266,584, a total exceeded only three times previously—under the Stevenson Restriction Scheme, in 1925, 1926, and 1927.



New York Outside Market—Spot Ribbed Smoked Sheets

Rubber shipments from all producing countries last year totaled 1,134,198 tons, as compared with 855,627 tons in 1936, according to the monthly bulletin of the International Rubber Regulation Committee. Shipments from countries participating in the restriction plan amounted to 1,106,959 tons in 1937; while shipments from other countries totaled 27,239 tons, or only slightly more than 2% of total crude rubber shipments.

On the following page are reported United States statistics on imports, consumption, stocks, and crude rubber afloat during January.

New York Outside Market

Factory buying and shipment business continued at a slow rate during February. With a rising market sentiment improved, but not sufficiently to create active factory buying. After closing at 15 7/16¢ per pound on January 25, the day exports were reduced by the IRRC, the price of No. 1 ribbed smoked sheets receded to close at 14¼¢ per pound on February 8. Thereafter the trend was upward, and the price advanced to 14¾¢ per pound on February 19.

The week-end closing prices on No. 1 ribber smoked sheets follow: January 29, 14½¢; February 5, 14¼¢; February 12, 14 7/16¢; February 19, 14¾¢, and February 26, 14 11/16¢.

New York Quotations

New York outside market rubber quotations in cents per pound

	Feb. 25, 1937	Jan. 26, 1938	Feb. 23, 1938
Plantations			
Rubber latex...*gal.*	79/80	56/57	55/56
Paras			
Upriver fine	21	13¼	12½
Upriver fine	*27¼	*19¼	*15½
Upriver coarse	14	9	8¾
Upriver coarse	*20¾	*15	*13
Islands fine	20½	13	11¾
Islands fine	*26	*18½	*15
Acre, Bolivian fine	21¼	13½	12¾
Acre, Bolivian fine	*27½	*19½	*16
Beni, Bolivian fine	22	14½	13¼
Madeira fine	21¼	13½	12½
Caucho			
Upper ball	14	9	8¾
Upper ball	*20¾	*15	*13
Lower ball	13½	8¾	8¼
Pontianak			
Pressed block	11/27	14/33	15/32
Guayule			
Duro, washed and dried	16	12	12
Ampar	17½	12½	12½
Africans			
Rio Nuñez	23	16	16
Black Kassai	23	16	16
Prime Niger flake	29	25	25
Gutta Percha			
Gutta Siak	10¾	13½	14½
Gutta Soh	14	22	20
Red Macassar	1.05	1.25/1.35	1.15/1.25
Balata			
Block, Ciudad Bolivar	32	33	..
Manaos block	25	27	26
Surinam sheets	33	33	34
Amber	38	39	39

*Washed and dried crepe. Shipments from Brazil.

New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	January, 1938							February, 1938															
	24	25	26	27	28	29	31	1	2	3	4	5	7	8	9	10	11	12*	14	15	16	17	18	19
No. 1 Ribbed Smoked Sheet	14 13/16	15 1/16	14 13/16	14¾	14 5/8	14½	14 5/8	14½	14 7/16	14¼	14 7/16	14¼	14¼	14¼	14 3/8	14 3/8	14 7/16	..	14 7/16	14½	14¾	14 13/16	14¾	14¾
No. 2 Ribbed Smoked Sheet	14 7/16	14¾	14 3/8	14 7/16	14 7/16	14 7/16	14 7/16	14 7/16	14	13 13/16	13¾	13 13/16	13 13/16	13 13/16	13 13/16	13 13/16	13 7/8	..	13 7/8	14 1/16	14 1/16	14 3/8	14 7/16	14 7/16
No. 3 Ribbed Smoked Sheet	13 13/16	14¼	13 13/16	13 7/8	13¾	13 5/8	13¾	13 5/8	13 7/16	13 3/8	13 7/16	13 3/8	13 3/8	13 3/8	13½	13½	13 7/16	..	13 7/16	13 5/8	13 7/8	13 13/16	13 7/8	13 7/8
No. 4 Ribbed Smoked Sheet	13¾	14 1/16	13¾	13 13/16	13 7/16	13 7/16	13 7/16	13 7/16	13¾	13 5/16	13 5/16	13 5/16	13 5/16	13 5/16	13 5/16	13 5/16	13¾	..	13¾	13 7/16	13 13/16	13¾	13 13/16	13 13/16
No. 1 Thin Latex Crepe	15 1/16	15 5/8	15¼	15 1/8	15	14 7/8	15	15	14 13/16	14¾	14 5/8	14 13/16	14¾	14¾	14 7/8	15 1/8	15 1/16	..	15 1/16	15¼	15½	15 5/16	15½	15½
No. 1 Thick Latex Crepe	15 1/16	15 5/8	15¼	15 1/16	15	14 7/8	15	14 7/8	14 13/16	14 5/8	14½	14 7/16	14 5/8	14 5/8	14¾	15 1/16	15 1/16	..	15 1/16	15¼	15½	15 5/16	15½	15½
No. 1 Brown Crepe	14 7/16	14 3/8	14 7/16	14	13 7/8	13¾	13 7/8	13¾	13 11/16	13½	13 3/8	13 7/16	13½	13½	13 5/8	13 5/8	13 7/16	..	13 7/16	13¾	14	14 1/16	13 7/8	13 7/8
No. 2 Brown Crepe	13 7/8	14 1/16	13 13/16	13 7/8	13¾	13 5/8	13¾	13 5/8	13 7/16	13 3/8	13 5/16	13 7/16	13 3/8	13 3/8	13½	13½	13 7/16	..	13 7/16	13 5/8	13 7/8	13 13/16	13¾	13¾
No. 2 Amber	14 7/16	14 3/8	14 7/16	14	13 7/8	13¾	13 7/8	13¾	13 11/16	13½	13 3/8	13 7/16	13½	13½	13 5/8	13 5/8	13 7/16	..	13 7/16	13¾	14	14 1/16	13 7/8	13 7/8
No. 3 Amber	13 7/8	14 1/16	13 13/16	13 7/8	13¾	13 5/8	13¾	13 5/8	13 7/16	13 3/8	13¼	13 7/16	13 3/8	13 3/8	13½	13½	13 7/16	..	13 7/16	13 5/8	13 7/8	13 13/16	13¾	13¾
No. 4 Amber	13¾	13 11/16	13 7/16	13 3/8	13¼	13 1/16	13¼	13 1/16	13 7/16	12 7/8	12¾	12 13/16	12 7/8	12 7/8	13	13	12 13/16	..	12 13/16	13 1/16	13 3/8	13 7/16	13 3/8	13 3/8
Rolled Brown	11 3/8	11 11/16	11 7/16	11 3/8	11¼	11 1/16	11¼	11 1/16	11 7/16	10 7/8	10¾	10 13/16	10 7/8	10 7/8	11	11 1/16	11 7/16	..	11 7/16	11 3/8	11 5/8	11 11/16	11 5/8	11 5/8

*Holiday.

IMPORTS, CONSUMPTION, AND STOCKS

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Imports* Tons	U. S. Consumption¶ Tons	U. S. Stocks Mfgrs. Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.— Public Warehouses, London, Liverpool†‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1935	448,116	491,544	303,000	39,094	164,295	28,304	782,600	938,520	650,494
1936	490,858	575,000	223,000	56,567	78,462	26,969	855,627	1,044,218	464,186
1937	584,851	542,947	256,618	63,099	57,785	44,814	1,134,198	1,092,078	.....
1937									
January ...	32,820	50,818	204,201	55,096	71,062	36,365	71,456	**92,918	422,426
February ..	43,289	51,887	195,080	53,538	63,760	42,132	70,482	93,017	407,807
March	52,039	54,064	191,928	56,994	52,077	42,485	102,144	104,347	445,722
April	35,850	51,797	174,934	72,530	48,748	38,812	89,378	93,457	401,027
May	50,840	51,733	172,985	58,542	46,628	34,234	86,563	101,219	386,403
June	48,956	51,798	169,646	57,215	43,427	45,085	95,477	101,789	414,990
July	39,108	43,650	164,445	75,779	42,175	44,759	111,772	89,705	408,783
August ...	48,785	41,456	171,052	80,439	45,211	47,873	102,333	89,864	417,082
September..	56,049	43,893	182,556	83,288	49,807	49,438	106,861	91,718	457,203
October ...	52,508	38,707	195,685	80,653	51,932	41,948	100,671	83,583	456,676
November .	56,302	33,984	217,586	81,302	54,857	38,803	93,983	77,689	468,507
December .	68,305	29,160	256,618	63,099	57,785	44,814	103,078	73,808	.....
1938									
January ..	42,135	29,429	269,078	57,356	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, and afloat. ¶Corrected to 100% from estimate of reported coverage. **Not including additional absorption from U.K. manufacturers' stocks for any month during 1937. The figure will be included in yearly total.

CRUDE rubber consumption by United States manufacturers during January is estimated at 29,429 long tons, against 29,160 long tons during December, 1937, a 1% increase, but 42.1% under the 50,818 long tons consumed in January, 1937, according to R.M.A. statistics.

Gross crude rubber imports for January are reported to be 42,135 long tons, 38.3% under the December figure of 68,305 long tons, but 28.4% over the 32,820 long tons imported in January, 1937.

Total domestic stocks of crude rubber on hand January 31 are estimated at 269,078 long tons, compared with December 31 stocks of 256,618 long tons and 204,201 long tons on hand January 31, 1937.

Crude rubber afloat to United States ports as of January 31 is figured to be 57,356 long tons, against 63,099 long tons afloat on December 31 and 55,095 long tons afloat on January 31, 1937.

London and Liverpool Stocks

Week Ended	London (Tons)	Liverpool (Tons)
January 29	39,822	21,708
February 5	41,404	21,965
February 12	42,093	22,613
February 19	44,461	23,905
February 26	46,464	24,761

RECLAIMED RUBBER

FOR the year 1937 reclaimed consumption amounted to 157,990 tons, according to figures released by the R.M.A. The same source estimates January reclaimed rubber consumption at 6,673 long tons; production, 8,467 long tons; and stocks on hand January 31, 27,179 long tons. Consumption of reclaim during December totaled 7,674 tons. The demand for reclaim continued light during February, but with improved sentiment at the latter part of the month better conditions are expected in the near future.

The market is steady, and all quotations remain at levels of one month ago.

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption†	Consumption % to Crude	U. S. Stocks*	Exports
1935	122,140	113,530	22.9	25,069	5,383
1936	150,571	141,486	24.6	19,000	7,085
1937	178,776	157,990	29.1	26,260	13,293
1937					
January	15,129	14,450	28.4	18,822	857
February	15,192	14,578	28.1	18,490	946
March	14,462	15,601	28.9	16,450	901
April	13,884	15,607	30.1	14,046	1,140
May	15,793	14,693	28.4	14,647	890
June	16,052	14,414	27.8	14,535	1,077
July	16,241	12,128	27.3	17,682	1,221
August	16,543	13,227	31.9	19,706	1,240
September	16,410	13,681	31.2	21,597	1,152
October	15,849	12,234	31.6	23,752	1,621
November	12,406	9,703	28.6	24,620	1,385
December	10,815	7,674	26.3	26,260	865
1938					
Jan.	8,467	6,673	22.7	27,179	....

*Stocks on hand the last of the month or year. †Corrected to 100% from estimate of reported coverage.
Compiled by The Rubber Manufacturers Association, Inc.

RUBBER SCRAP

WITH reclaimers working on the same reduced basis as in January, demand for scrap continued low. The scrap market, as noted on February 21, was somewhat easier, with slight recessions in price covering a broad range: black boots and shoes were off ⅛¢ per pound; inner tubes dropped ¼ to ½¢ per pound; mixed auto tires declined $1 per ton; and black auto peelings fell off $4 per ton. In the mechanical grades mixed black scrap dropped $4 per ton; while hose scrap receded $2 to $8 per ton. Hard rubber dropped ½ to ⅜¢ per pound, and all other quotations remained at former levels.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)
February 21, 1938

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01 /$0.01¼
Colored	lb.	.00¾/ .00⅞
Untrimmed arctics	lb.	.00¾/ .00⅞
Inner Tubes		
No. 1, floating	lb.	.09½/ .10
No. 2, compound	lb.	.04 / .04¼
Red	lb.	.03¾/ .04
Mixed tubes	lb.	.03½/ .03¾
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	12.50 /13.00
Beadless	ton	17.50 /18.00
Auto tire carcass	ton	17.00 /18.00
Black auto peelings	ton	20.00 /21.00
Solid		
Clean mixed truck	ton	28.00 /29.00
Light gravity	ton	42.00 /43.00
Mechanicals		
Mixed black scrap	ton	18.00 /20.00
Hose, air brake	ton	18.00 /20.00
Garden, rubber covered	ton	11.00 /12.00
Steam and water, soft	ton	11.00 /12.00
No. 1 red	lb.	.03 / .03¼
No. 2 red	lb.	.02¾/ .03
White druggists' sundries	lb.	.04½/ .04¼
Mechanical	lb.	.01¾/ .02
Hard Rubber		
No. 1 hard rubber	lb.	.12 / .12½

New York Quotations

February 21, 1938

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	6¼/ 6½
Acid	1.18-1.22	7¼/ 7½
Shoe		
Standard	1.56-1.60	7 / 7¼
Tubes		
No. 1 Floating	1.00	14 /14¼
Compounded	1.10-1.12	9 / 9¼
Red Tube	1.15-1.30	9 / 9½
Miscellaneous		
Mechanical Blends	1.25-1.50	4¼/ 5
White	1.35-1.50	13 /13½

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

COMPOUNDING INGREDIENTS

MARKET conditions showed some improvement during February; and, while volume is still relatively small, it is expected that the low point in activity has been passed. The price structure has shown little change over quotations of the preceding month.

CARBON BLACK. There has been no change in the domestic price for standard grades of black since January 12, when a base price (f.o.b. Texas) of 2¼¢ per pound (3.3¢ delivered Akron, O.), was established for either tank car or carload lots in bags. Demand for carbon black has been light, although February sales have been running somewhat ahead of January.

Export prices have been cut ¾¢ per pound. Export black is sold on a c.i.f. foreign port basis, and the nominal equivalent prices on an f.a.s. basis at Gulf ports are now 4¾¢ per pound for fully compressed and 5¼¢ per pound for uncompressed black. According to the Department of Commerce, exports of black in 1937 were 184,000,000 pounds, against 155,000,000 pounds in 1936.

FACTICE OR RUBBER SUBSTITUTE. The demand for rubber substitute has continued light, and prices remain at previous levels.

LITHARGE. Following the drop in metal values, the price for carload lots receded 2/5¢ per pound, while l.c.l. prices were lowered ¼¢ per pound. Demand has been light.

LITHOPONE. Business has been inactive during the past month. Prices for all grades remain unchanged.

RUBBER CHEMICALS. The demand for rubber chemicals has continued low, with the anticipation for better volume in March and April. Prices in general are unchanged.

RUBBER SOLVENTS. Tank car prices in the Northern New Jersey market were lowered ½¢ to 9½¢ per gallon, and the tank wagon price in the same area was lowered 1½¢ to the basis of 13¢ per gallon. Elsewhere prices held an even position. As tire production schedules have been stepped up over the January rate, the deliveries of solvents into the Akron district have been improved.

STEARIC ACID. Weakness in tallow found no reflection in the market for stearic acid, and former quotations were maintained by producers. Business was quiet, as consumers limited their purchases to relatively small or moderate quantities.

TITANIUM PIGMENTS. Although sales during February showed a slight improvement over the preceding month, they were 20% below January, 1937. Business in January of this year, however, was 30% higher than in December, 1937. Prices hold an unchanged position.

The Department of Commerce reported that a Brazilian firm is in a position to export pulverized rutile with a minimum content of 94% TiO_2, according to information received from the consulate at Rio de Janeiro.

ZINC OXIDE. The decline in the price of pig lead did not affect the position of leaded zinc oxides, and prices of all grades remain unchanged. The demand from the paint and rubber industries was light during the past month.

New York Quotations

February 24, 1938

Prices Not Reported Will Be Supplied on Application

Abrasives			
Pumicestone, powdered	lb.	$0.03	/$0.035
Rottenstone, domestic	lb.	.03	/ .035
Silica, 15	ton	38.00	
Accelerators, Inorganic			
Lime, hydrated, l.c.l., New York	ton	20.00	
Litharge (commercial)	lb.	.0675/	.0725
Accelerators, Organic			
A-1	lb.	.26	
A-5-10	lb.	.35 /	.40
A-7	lb.	.42 /	.55
A-10	lb.	.35 /	.40
A-11	lb.	.52 /	.65
A-19	lb.	.52 /	.65
A-32	lb	.70 /	.80
A-77	lb.	.42 /	.55
A-100	lb.	.42 /	.55
A-100-F-50	lb.	.25 /	.35
A-433	lb.	.45 /	.55
Accelerator 49	lb.	.42	
808	lb.		
833	lb.		
Acrin	lb.		
Aldehyde ammonia	lb.		
Altax	lb.		
B-J-F	lb.		
Beutene	lb.		
Butyl Zimate	lb.		
C-P-B	lb.		
Captax	lb.		
Crylene	lb.		
Paste	lb.		
D-B-A	lb.		
Di-Esterex	lb.		
Di-Esterex-N	lb.		
DOTG	lb.	.47	
D.O.T.T.U.	lb.		
DPG	lb.	.35 /	.45
El-Sixty	lb.	.50 /	.65
Ethylideneaniline	lb.		
Formaldehyde P.A.C.	lb.		
Formaldehydeaniline	lb.		
Formaldehyde-para-toluidine	lb.		
Guantal	lb.	.40 /	.50
Hepteen	lb.		
Base	lb.		
Hexamethylenetetramine	lb.		
Lead oleate, No. 999	lb.	.14	
Witco	lb.	.15	
Methylenedianilide	lb.		
Monex	lb.		
Novex	lb.		
O. N. V.	lb	.50 /	.55
O-X-A-F	lb.	.50 /	.55
Ovac	lb.		
Pip-Pip	lb.	$2.50	
Pipsolene	lb.	1.55	/$1.85
R-2	lb.	1.40 /	1.80
Base	lb.	3.65	
R-23	lb.	.40	
R & H 50-D	lb.		
Safex	lb.		
Santocure	lb.	1.05 /	1.30
Super-sulphur No. 1	lb.		
No. 2	lb.		
Tetrone A	lb.		
Thiocarbanilide	lb.	.24 /	.30
Thionex	lb.		
Trimene	lb.		
Base	lb.		
Triphenyl guanidine (TPG)	lb.		
Tuads	lb.		
Ureka	lb.	.60 /	.75
Blend B	lb.	.60 /	.75
C	lb.	.56 /	.65
Vulcanex	lb.		
Vulcanol	lb.		
Vulcone	lb.		
Z-B-X	lb.		
Z-88	lb.	.44 /	.60
Z-88-P	lb.	.51	
Zenite	lb.		
A	lb.		
B	lb.		
Zimate	lb.		
ZML	lb.		
Activator			
Barak	lb.		
Age Resisters			
AgeRite Alba	lb.		
Exel	lb.		
Gel	lb.		
Hipar	lb.		
HP	lb.		
Powder	lb.		
Resin	lb.		
D	lb.		
Syrup	lb.		
White	lb.		
Akroflex C	lb.		
Albasan	lb.		
Antox	lb.		
B-L-E	lb.		
B-X-A	lb.		
Copper Inhibitor X-872	lb.		
Flectol B	lb.	.52 /	.65
H	lb.	.52 /	.65
White	lb.	.90 /	1.15
M-U-F	lb.		
Neozone (standard)	lb.		
A	lb.		
C	lb.		
D	lb.		
E	lb.		
Oxynone	lb.	$0.64	/$0.80
Parazone	lb.		
Perflectol	lb.	.65 /	.75
Permalux	lb.		
Santoflex A	lb.	.65 /	.75
B	lb.	.52 /	.65
Solux	lb.		
Thermoflex	lb.		
A	lb.		
V-G-B	lb.		
Alkalies			
Caustic soda, flake, Columbia (400 lb. drums)	100 lbs.	2.70 /	3.55
liquid, 50%	100 lbs.	1.95	
solid (700 lb. drums)	100 lbs.	2.30 /	3.15
Antiscorch Materials			
A-F-B	lb.		
Antiscorch T.	lb.		
Cumar RH	lb.	.09	
R-17 Resin (drums)	lb.	.10	
Retarder B	lb.		
W	lb.		
T-J-B	lb.		
U.T.B.	lb.		
Antisun Materials			
Heliozone	lb.		
Sunproof	lb.		
Brake Lining Saturant			
B. R. T. No. 3	lb.	.0165/	.0175
Colors			
BLACK			
Lampblack (commercial)	lb.	.15	
BLUE			
Brilliant	lb.		
Prussian	lb.	.0375	
Toners	lb.	.08 /	3.85
BROWN			
Mapico	lb.	.13	
GREEN			
Brilliant	lb.		
Chrome, light	lb.		
medium	lb.		
oxide (freight allowed)	lb.	.22	
Dark	lb.		
Guignet's, Easton, Pa., bbls.	lb.	.70	
Light	lb.		
Toners	lb.	.85 /	3.75

ORANGE
- Lake ..... lb.
- Toners ..... lb. $0.40 /$1.60

ORCHID
- Toners ..... lb. 1.50 / 2.00

PINK
- Toners ..... lb. 1.50 / 4.15

PURPLE
- Permanent ..... lb.
- Toners ..... lb. .60 / 2.10

RED
- Antimony
  - Crimson, 15/17% ..... lb. .45
  - R. M. P. No. 3 ..... lb. .48
  - Sulphur free ..... lb. .50
  - R.M.P. ..... lb. .52
  - Golden 15/17% ..... lb. .28
  - 7-A ..... lb. .37
  - Z-2 ..... lb. .23
- Aristi ..... lb. 1.75
- Cadmium, light (400 lb. bbls.) ..... lb. .76 / .81
- Chinese ..... lb.
- Crimson ..... lb.
- Mapico ..... lb. .0925
- Medium ..... lb.
- Rub-Er-Red, Easton, Pa., bbls. ..... lb. .0925
- Scarlet ..... lb.
- Toners ..... lb. .08 / 2.00

WHITE
- **Lithopone (bags)** ..... lb. .04⅜/ .04⅝
- Albalith Black Label-11 ..... lb. .04¾/ .04⅞
- **Astrolith** ..... lb. .04¾/ .04⅞
- **Azolith** ..... lb. .04¾/ .04⅞
- **Cryptone-19** ..... lb. .05¾/ .06⅛
- CB-21 ..... lb. .05⅞/ .06⅛
- **ZS No. 20** ..... lb. .09 / .0925
- No. 86 ..... lb. .09 / .0925
- Sunolith ..... lb. .04¾/ .04⅞
- **Ray-Bar** ..... lb.
- **Ray-Cal** ..... lb.
- **Rayox** ..... lb.
- **Titanolith (5-ton lots)** ..... lb. .05¾/ .06⅛
- Titanox-A (50-lb. bags) ..... lb. .16 / .1675
- B (50-lb. bags) ..... lb. .05¾/ .06⅛
- B-30 (50-lb. bags) ..... lb. .05¾/ .06⅛
- **C (50-lb. bags)** ..... lb. .05¾/ .06⅛
- **Ti-Tone** ..... lb.
- Zinc Oxide
  - Anaconda, Green Seal No. 333 ..... lb. .08 / .085
  - **Lead Free No. 352** ..... lb. .075 / .08
  - No. 570 ..... lb. .075 / .08
  - No. 577 ..... lb. .075 / .08
  - Red Seal No. 222 ..... lb. .075 / .08
  - **U.S.P. No. 777 (bbls.)** ..... lb. .095 / .0975
  - **White Seal No. 555** ..... lb. .085 / .09
  - **Azo ZZZ-11** ..... lb. .0625/ .065
  - **44** ..... lb. .0625/ .065
  - **55** ..... lb. .0625/ .065
  - **66** ..... lb. .0625/ .065
  - **French Process, Florence**
    - White Seal-7 (bbls.) ..... lb. .085 / .0875
    - **Green Seal-8** ..... lb. .08 / .0825
    - Red Seal-9 ..... lb. .075 / .0775
  - **Kadox, Black Label-15** ..... lb. .065 / .0675
  - **Red Label-17** ..... lb. .065 / .0675
  - **No. 25** ..... lb. .075 / .0775
  - **Horse Head Special 3** ..... lb. .0625/ .065
  - XX Red-4 ..... lb. .0625/ .065
  - **23** ..... lb. .0625/ .065
  - **72** ..... lb. .0625/ .065
  - **78** ..... lb. .0625/ .065
  - **80** ..... lb. .0625/ .065
  - **103** ..... lb. .0625/ .065
  - **110** ..... lb. .0625/ .065
  - St. Joe (lead free)
    - Black Label ..... lb. .06 / .0625
    - Green Label ..... lb. .06 / .0625
    - Red Label ..... lb. .06 / .0625
- U.S.P. ..... lb. .095 / .0975
- White Jack ..... lb. .09 / .0925
- Zopaque (bags) ..... lb. .16 / .1675

YELLOW
- Cadmolith (cadmium yellow), 400 lb. bbls. ..... lb. .51 / .56
- Lemon ..... lb.
- **Mapico** ..... lb. .0925
- Toners ..... lb. 2.50

Dispersing Agents
- **Bardol** ..... lb. .0215/ .024
- **Darvan** ..... lb.
- Nevoil (drums) ..... lb. .0215
- Santomerse ..... lb. .11 / .25

Fillers, Inert
- **Asbestine, c.l., f.o.b. mills** ..... ton 15.00
- **Barytes** ..... ton 20.00 /36.00
- f.o.b. St. Louis (50 lb. paper bags) ..... ton 22.85
- Barytes, off color, domestic ..... ton 20.00 /25.00
- white, imported ..... ton 29.00 /32.00
- Blanc fixe, dry, precip. ..... lb. .035 / .05
- Calcene ..... ton 37.50 /43.00
- **Infusorial earth** ..... lb. .02 / .03
- **Kalite No. 1** ..... ton
- **No. 3** ..... ton
- **Magnesia, calcined, heavy** ..... lb. .04
- Carbonate, l.c.l. ..... lb. .07 / .095
- Pyrax ..... ton
- Whiting
  - **Columbia Filler** ..... ton $9.00 /$14.00
  - Domestic ..... 100 lbs.
  - Guilders ..... 100 lbs.
  - Hakuenka ..... lb.
  - Paris white, English cliff-stone ..... 100 lbs.
  - Southwark Brand, Commercial ..... 100 lbs.
  - All other grades ..... 100 lbs.
- Suprex, white extra light ..... ton 45.00 /60.00
- heavy ..... ton 45.40 /60.00
- Witco, c.l. ..... ton 7.00

Fillers for Pliability
- **P-33** ..... lb.
- **Thermax** ..... lb.
- **Velvetex** ..... lb. .03 / .045

Finishes
- **IVCO lacquer, clear** ..... gal. 1.55 / 2.55
- **colors** ..... gal. 2.60 / 3.25
- Rubber lacquer, clear ..... gal.
- colored ..... gal.
- Starch, corn, pwd. ..... 100 lbs.
- potato ..... lb.
- Talc ..... ton 25.00 /45.00

Flock
- Cotton flock, dark ..... lb. .12 / .13
- dyed ..... lb. .50 / .85
- **white** ..... lb. .145 / .20
- Rayon flock, colored ..... lb. 1.25 / 2.00
- white ..... lb. 1.00 / 1.25

Latex Compounding Ingredients
- **Accelerator 85** ..... lb.
- 89 ..... lb.
- 122 ..... lb.
- 552 ..... lb.
- Aerosol ..... lb. .45
- Antox, Dispersed ..... lb.
- Aquarex A ..... lb.
- D ..... lb.
- F ..... lb.
- Areskap No. 50 ..... lb. .18 / .24
- No. 100, dry ..... lb. .39 / .51
- **Aresket No. 240** ..... lb. .16 / .22
- No. 250, alcoholic ..... lb. .22
- No. 300, dry ..... lb. .42 / .50
- Areskiene No. 375 ..... lb. .35 / .50
- No. 400, dry ..... lb. .51 / .65
- Black No. 25, Dispersed ..... lb. .22 / .40
- Catalpo ..... ton
- Color Pastes, Dispersed ..... lb.
- Dispersex No. 15 ..... lb. .11 / .12
- No. 20 ..... lb. .08 / .10
- Emo, brown ..... lb. .15
- white ..... lb. .15
- Factice Compound, Dispersed ..... lb. .35
- Heliozone, Dispersed ..... lb.
- Igepon A ..... lb.
- MICRONEX, Colloidal ..... lb. .055 / .07
- Nekal BX (dry) ..... lb.
- Palmol ..... lb. .12
- **Paradora** ..... lb.
- Pipsol X ..... lb. 3.05 / 3.55
- R-23 ..... lb. .57
- RN-2 ..... lb. 1.40 / 1.80
- S.1 (400 lb. drums) ..... lb. .65
- Santomerse ..... lb. .11 / .25
- Dry ..... lb. .41 / .65
- Santovar A ..... lb. 1.15 / 1.40
- Stablex A ..... lb. .90 / 1.10
- B ..... lb. .65 / .90
- C ..... lb. .40 / .50
- Sulphur, Dispersed ..... lb. .10 / .15
- No. 2 ..... lb.
- T.1. (400 lb. drums) ..... lb. .40
- Tepidone ..... lb.
- Vulcan Colors ..... lb.
- **Zinc oxide, Colloidal** ..... lb.
- Dispersed ..... lb. .12 / .15

Mineral Rubber
- B. R. C. No. 20 ..... lb. .009 / .01
- Black Diamond ..... ton 25.00
- Genasco Hydrocarbon, granulated, (fact'y) ..... ton
- solid ..... ton
- Gilsonite Hydrocarbon (factory) ..... ton
- Hydrocarbon, hard ..... ton
- soft ..... ton
- Parmr Grade 1 ..... ton 25.00 /27.00
- Grade 2 ..... ton 25.00 /27.00
- Pioneer ..... ton
- 265° ..... ton

Mold Lubricants
- **Lubrex** ..... lb. .25 / .30
- Mold Paste ..... lb. .12 / .15
- Sericite ..... ton 65.00 /75.00
- Soapbark ..... lb.
- Soapstone ..... ton 25.00 /35.00

Oil Resistant
- AXF ..... lb.

Reclaiming Oils
- B. R. V. ..... lb. .03 / .0325
- S. R. O. ..... lb. .0175/ .0185

Reenforcers
- Carbon Black
  - Aerfloted Arrow Specification Black ..... lb.
  - Arrow Compact Granulized Carbon Black ..... lb.
  - "Certified" Heavy Compressed, Cabot ..... lb.
  - Spheron ..... lb.
  - **Continental Dustless** ..... lb. $0.0270/$0.0360
  - Compressed c.l. ..... lb. .0270/ .0360
  - **Uncompressed, c.l.** ..... lb. .0270/ .0360
  - Disperso, c.l. ..... lb. .0270/ .0360
  - Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex. ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local stock, bags, delivered ..... lb. .0625
  - Dixiedensed, c.l., f.o.b., New Orleans, La., Galveston or Houston, Tex. ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local stock, bags, delivered ..... lb. .0625
  - Dixiedensed 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex. ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local stock, bags, delivered ..... lb. .0625
  - **Excello, c.l., f.o.b. Gulf** ports ..... lb. .0445/ .0645
  - delivered New York ..... lb. .0505/ .0705
  - l.c.l., delivered New York ..... lb. .07 / .09
  - Fumonex, c.l., f.o.b. works ..... lb. .03
  - ex-warehouse ..... lb. .045
  - Gastex ..... lb. .03 / .07
  - **Kosmobile, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.** ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local stock, bags, delivered ..... lb. .0625
  - Kosmobile 66, c.l., f.o.b New Orleans, La., Galveston or Houston, Tex. ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local stock, bags, delivered ..... lb. .0625
  - **Kosmos, c.l., f.o.b. New** Orleans, La., Galveston or Houston, Tex. ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local stock, bags, delivered ..... lb. .0625
  - MICRONEX Beads, c.l., f.o.b. Gulf ports ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local, stock, bags, delivered ..... lb. .0625
  - Mark II, c.l., f.o.b. Gulf ports ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local, stock, bags, delivered ..... lb. .0625
  - Standard, c.l., f.o.b. Gulf ports ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local, stock, bags, delivered ..... lb. .0625
  - W-5, c.l., f.o.b., Gulf ports ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local, stock, bags, delivered ..... lb. .0625
  - W-6, c.l., f.o.b., Gulf ports ..... lb. .027
  - c.l., delivered New York ..... lb. .036
  - local, stock, bags, delivered ..... lb. .0625
- Paradene No. 2 (drums) ..... lb. .04
- Pelletex ..... lb. .03 / .07
- Supreme, c.l., f.o.b. Gulf ports ..... lb. .0445/ .0645
- delivered New York ..... lb. .0505/ .0705
- l.c.l. delivered New York ..... lb. .07 / .09
- **"WYEX BLACK"** ..... lb.
- Carbonex (bags) ..... lb. .029 / .0315
- "S" (bags) ..... lb. .0315/ .034
- Clays
  - Aerfloted Paragon (50 lb. bags) ..... ton 9.50
  - Suprex (50 lb. bags) ..... ton 9.50
  - China ..... ton 17.50 /20.00
  - Dixie ..... ton
  - Junior ..... ton
  - McNamee ..... ton
  - Par ..... ton
  - **Witco, f.o.b. Works** ..... ton 9.50
- Cumar EX ..... lb. .035

(*Continued on page* 84)

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Jan. 1	Jan. 29	Feb. 5	Feb. 12	Feb. 19
Jan.	8.19	....	....	....	....
Feb.	....	8.31	8.52	....	....
Mar.	8.28	8.33	8.54	8.71	9.00
July	8.42	8.46	8.72	8.88	9.16
Sept.	8.46	8.52	8.80	8.92	9.25
Dec.	8.51	8.64	8.89	8.98	9.25
Jan.	....	8.66	8.92	9.00	9.27

New York Quotations

February 23, 1938

Drills

38-inch 2.00-yard	yd.	$0.11
40-inch 3.47-yard		.06⅞
50-inch 1.52-yard		.15
52-inch 1.85-yard		.12½
52-inch 1.90-yard		.12
52-inch 2.20-yard		.10¾
52-inch 2.50-yard		.09½
59-inch 1.85-yard		.12¾

Ducks

38-inch 2.00-yard D. F.	yd.	.11
40-inch 1.45-yard S. F.		.16¼
51½-inch 1.35-yard D. F.		.16¾
72-inch 1.05-yard D. F.	.22	/.23
72-inch 17.21-ounce		.25¼

Mechanicals

Hose and belting	lb.	.24

Tennis

52-inch 1.35-yard	yd.	.17

Hollands

Gold Seal and Eagle

20-inch No. 72	yd.	.09½
30-inch No. 72		.17
40-inch No. 72		.19

Red Seal and Cardinal

20-inch	yd.	.08
30-inch		.14¾
40-inch		.16
50-inch		.24

Osnaburgs

40-inch 2.34-yard	yd.	.09⅝
40-inch 2.48-yard		.09
40-inch 2.56-yard		.08½
40-inch 3.00-yard		.07⅞
40-inch 7-ounce part waste		.07
40-inch 10-ounce part waste		.10
37-inch 2.42-yard		.09⅛

Raincoat Fabrics

Cotton

Bombazine 60 x 64	yd.	.07½
Plaids 60 x 48		.10¾
Surface prints 60 x 64		.11¾
Print cloth, 38½-inch, 60 x 64		.04¾

Sheetings—40-Inch

48 x 48, 2.50-yard	yd.	.07½
64 x 68, 3.15-yard		.07¼
56 x 60, 3.60-yard		.06⅛
44 x 40, 4.25-yard		.05

Sheetings, 36-Inch

48 x 48, 5.00-yard	yd.	.04¾
44 x 40, 6.15-yard		.03½

Tire Fabrics

Builder

17¼ ounce 60" 23/11 ply Karded peeler	lb.	.30

Chafer

14 ounce 60" 20/8 ply Karded peeler	lb.	.30
9¾ ounce 60" 10/2 ply Karded peeler	lb.	.29

Cord Fabrics

23/5/3 Karded peeler, 1/16" cotton	lb.	.31
15/3/3 Karded peeler, 1/16" cotton	lb.	.29
23/5/3 Karded peeler, 1¼" cotton	lb.	.36½
23/5/3 Combed Egyptian	lb.	.50

Leno Breaker

8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.32

THE accompanying table of week-end closing prices on the New York Cotton Exchange shows the week-end change of representative futures covering the past two months.

The New York spot middling price closed at 8.60¢ per pound on January 24, after which the trend was downward until January 31 when the market started an upward movement which persisted throughout February. The price trend gained momentum upon passage of the farm bill and under influence from Washington which suggested inflation and intent of the Administration to raise the level of raw material values. The market closed on February 26 with spot cotton at 9.22¢ per pound.

Sales at 13 southern markets totaled 388,687 bales during 22 days since January 22, as compared with 189,975 bales for the same days one year ago. Trading held at a moderate rate throughout February.

The most significant feature of the past month was the final enactment of the farm bill which provides for a sharp acreage cut for the 1938 crop. The bill further provides for loans should the next crop fall in price below about 8.35¢ a pound.

Consumption of all cotton in domestic mills during January totaled 434,740 bales, as compared with 433,058 in December, and 678,786 in January last year, according to a report of the Census Bureau.

Fabrics

With raw cotton in the 9¢ per pound price range, underlying conditions in the cloth market improved over a month ago, and, should these conditions be maintained, a decidedly firmer market and accelerated demand should result. While some improvement in demand has been noted, it has not been sufficient as yet to alter the price structure to any marked degree.

With the exception of tire fabrics, prices remain in general at levels quoted one month ago. Tire fabric prices have all advanced ½¢ per pound.

New York Quotations

(*Continued from page 82*)

Reodorants

Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Curodex 19	lb.	$2.75
188	lb.	3.50
198	lb.	4.50
Paradors	lb.	
Rodo No. C	lb.	
No. 10	lb.	

Rubber Substitutes

Black	lb.	.07 /$0.135
Brown	lb.	.085 / .14
White	lb.	.085 / .1525

Factice

Amberex	lb.	.20
Brown	lb.	.085 / .14
Neophax A	lb.	.11
B	lb.	.11
Fac-Cel B	lb.	$0.1625
C	lb.	.1625
White	lb.	.085 /$0.1525

Softeners

Burgundy pitch	lb.	.06
Cycline oil	gal.	.14 / .20
Nuba resinous pitch (drums)		
Grades No. 1 and No. 2	lb.	.03
Grade No. 3	lb.	.04
Palm oil (Witco), c.l.	lb.	.0575
Pine tar	gal.	
Plastogen	lb.	
Plastone	lb.	.30 / .35
R-19 Resin (drums)	lb.	.10
R-21 Resin (drums)	lb.	.10
Reogen	lb.	
Rosin oil, compounded	gal.	.40
RPA No. 1	lb.	
No. 2	lb.	
Rubtack	lb.	.10
Tackol	lb.	.085 / .18
Tonox	lb.	.16
Powder	lb.	
Witco No. 20	gal.	.20
X-1 Resinous oil (tank car)	lb.	.01

Softeners for Hard Rubber Compounding

Resin C Pitch 55° C. M.P.	lb.	.013 / .014
Resin C Pitch 70° C. M.P.	lb.	.013 / .014
Resin C Pitch 85° C. M.P.	lb.	.013 / .014

Solvents

Beta-Trichlorethane	gal.	
Bondogen	lb.	
Carbon bisulphide	lb.	
tetrachloride	lb.	
Industrial 90% benzol (tank car)	gal.	.16

Stabilizers for Cure

Laurex, ton lots	lb.	
Stearex B	lb.	.105 / .115
Beads	lb.	.095 / .105
Stearic acid, single pressed	lb.	.105 / .115
Stearite	100 lbs.	9.50 /10.50
Zinc stearate	lb.	.23

Synthetic Rubber

Neoprene Latex Type 50	lb.	
53	lb.	
54	lb.	
Type E	lb.	
"Thiokol" A (f.o.b. Yardville)	lb.	.35
Coating Materials	gal.	2.50 / 5.00
DX	lb.	.55
Molding Powder	lb.	.50 / .75

Tackifier

B. R. H. No. 2	lb.	.015 / .016

Varnish

Shoe	gal.	1.45

Vulcanizing Ingredients

Sulphur		
Chloride, drums	lb.	.035 / .04
Rubber	100 lb.	2.65
Telloy	lb.	
Vandex	lb.	

(See also Colors—Antimony)

Waxes

Carnauba, No. 3 chalky	lb.	.37½
2 N.C.	lb.	.39½
3 N.C.	lb.	.37½
1 Yellow	lb.	.4575
2	lb.	.4425
Montan, crude	lb.	.11

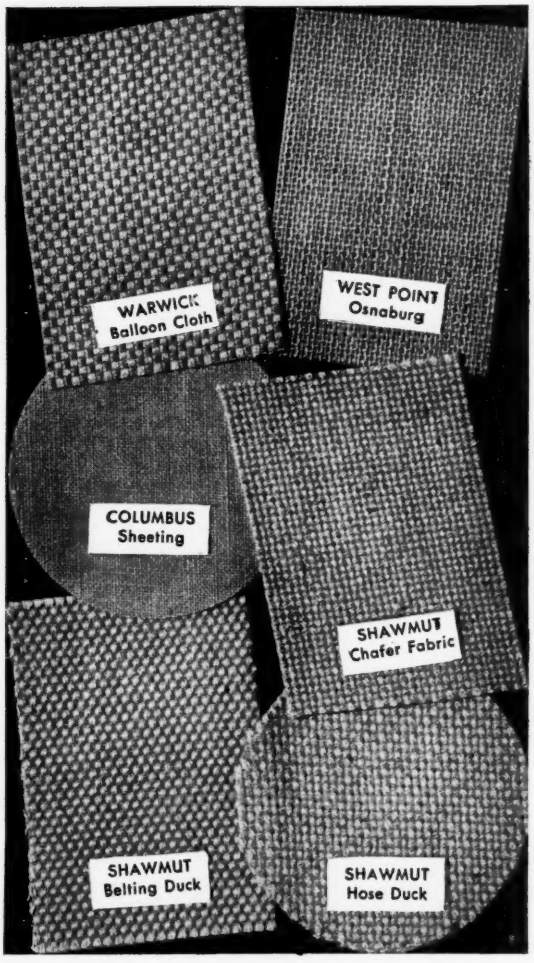
Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	INQUIRY
2430	Supplier of Calfix.
2431	Supplier of Velvetone.
2432	Supplier of Prenite.
2433	Manufacturer of rubber flowers.
2434	Manufacturer of machinery for making door mats from old tires.
2435	Supplier of Plastoit.
2436	Manufacturer of Crepe Kraft Paper, made in Canada.
2437	Manufacturer of rubber flags.

Special Specifications

FOR COTTON FABRICS . . .



BECAUSE we have one of the largest and most complete cotton textile organizations in the world which includes 17 modern mills in charge of experienced mill men; complete up-to-the-minute laboratory and research facilities; and a staff of technical engineers, we are in a position to cooperate intelligently with rubber engineers in the development of cotton fabrics built to special specification.

In addition to the usual constructions of hose and belting ducks, sheetings, osnaburgs and aeronautical fabrics, our engineers have been able to help materially in the development of special fabrics for particular requirements.

We welcome the opportunity of working with you on any fabric problem.

WELLINGTON SEARS COMPANY

65 Worth Street, New York, N. Y.

BOSTON • CHICAGO • DETROIT • PHILADELPHIA • ATLANTA • ST. LOUIS • NEW ORLEANS • LOS ANGELES • SAN FRANCISCO

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	November, 1937		Eleven Months Ended November, 1937	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber.....1,000 *lbs.*	116,385	$19,905,523	1,134,771	$212,372,835
Liquid latex	4,671,099	875,074	47,893,059	9,519,506
Jelutong or pontianak	1,328,165	194,889	12,954,857	1,547,233
Balata	64,696	9,374	723,936	139,853
Gutta percha	305,459	53,185	1,650,487	337,640
Guayule	563,087	69,452	5,713,987	711,526
Siak	87,507	7,926	484,728	43,642
Scrap and reclaimed	555,871	18,866	12,694,170	407,932
Totals	7,692,269	$21,134,289	83,249,995	$225,080,167
Chicle, crude ...*Free*	489,088	$136,154	8,391,880	$2,400,564
MANUFACTURED—*Dutiable*				
Rubber tires ...*number*	4,404	$3,681	68,032	$111,540
Rubber boots, shoes, and overshoes ...*pairs*	8,361	2,188	36,229	14,982
Rubber soled footwear with fabric uppers ...*pairs*	105,829	16,779	854,727	206,415
Golf balls ...*number*	48	14	527,538	60,201
Lawn tennis balls...*number*	408	48	304,602	26,605
Other rubber balls...*number*	210,150	3,457	4,335,549	142,907
Other rubber toys, except balls	.....	6,088	.....	102,958
Hard rubber combs..*number*	152,421	9,602	841,968	54,099
Other manufactures of hard rubber	.....	2,983	.....	31,365
Friction or insulating tape..	1,000	62	148,600	8,421
Belts, hose, packing, and insulating material	.....	23,754	.....	244,252
Druggists' sundries of soft rubber	.....	6,309	.....	74,894
Inflatable swimming belts, floats, etc. ...*number*	36	5	872,439	57,921
Other rubber and gutta percha manufactures....*lb.*	82,537	25,659	1,419,461	326,560
Totals	.....	$100,629	.....	$1,463,120

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	355,195	$66,501	17,154,385	$3,294,644
Balata	42,387	12,606	616,776	178,025
Gutta percha, rubber substitutes, and scrap	204,329	27,164	1,025,650	169,800
Rubber manufactures	.....	877	.....	20,456
Totals	.....	$107,148	.....	$3,662,925

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed ...*lb.*	3,102,970	$162,372	27,734,337	$1,333,124
Scrap ...*lb.*	4,863,558	109,170	71,903,267	1,436,020
Cements ...*gal.*	47,695	64,179	324,855	311,700
Rubberized automobile cloth, *sq. yd.*	37,402	17,413	535,767	242,252
Other rubberized piece goods and hospital sheeting..*sq. yd.*	179,264	81,337	1,748,460	751,237
Footwear				
Boots ...*pairs*	13,508	30,870	98,464	222,175
Shoes ...*pairs*	16,979	11,079	239,671	143,877
Canvas shoes with rubber soles ...*pairs*	10,003	8,443	391,513	235,549
Soles ...*doz. prs.*	3,454	6,780	42,027	82,680
Heels ...*doz. prs.*	30,522	18,157	500,036	296,839
Soling and top lift sheets...	27,219	4,670	577,788	107,461
Gloves and mittens..*doz. prs.*	7,862	16,346	84,997	181,822
Water bottles and fountain syringes ...*number*	23,329	11,537	289,648	120,617
Other druggists' sundries....	.....	55,234	.....	562,139
Gum rubber clothing *doz.*	35,000	45,371	327,130	531,912
Balloons ...*gross*	69,700	54,513	452,611	353,816
Toys and balls	.....	23,196	.....	176,944
Bathing caps ...*doz.*	1,899	2,259	49,012	76,603
Bands ...*lb.*	18,862	8,512	255,722	109,052
Erasers ...*lb.*	29,381	13,958	372,162	210,704
Hard rubber goods				
Electrical battery boxes..*no.*	12,486	9,055	260,266	156,773
Other electrical...*lb.*	33,300	10,583	398,676	97,869
Combs, finished ....*doz.*	9,341	6,769	105,678	68,041
Other hard rubber goods..	.....	19,334	.....	221,472
Tires				
Truck and bus casings, *number*	21,036	478,745	221,939	4,659,391
Other automobile casings, *number*	49,304	550,626	712,413	7,491,382
Tubes, auto ...*number*	39,531	64,491	582,608	912,290
Other casings and tubes, *number*	5,256	29,366	79,251	524,223
Solid tires for automobiles and motor trucks..*number*	152	5,494	3,762	111,873
Other solid tires	48,235	8,992	960,639	155,199
Tire sundries and repair materials	.....	45,232	.....	721,049
Rubber and friction tape..*lb.*	48,178	13,908	736,473	194,799
Fan belts for automobiles.*lb.*	50,600	27,448	685,737	384,942
Other rubber and balata belts ...*lb.*	210,560	108,171	2,981,790	1,567,807
Garden hose ...*lb.*	33,368	6,926	783,793	162,061
Other hose and tubing....*lb*	335,111	122,356	4,828,978	1,854,265
Packing ...*lb.*	111,618	52,558	1,653,184	723,707
Mats, matting, flooring, and tiling ...*lb.*	103,809	17,691	1,054,587	163,392
Thread ...*lb.*	50,873	28,941	633,602	339,514
Gutta percha manufactures.*lb.*	90,244	29,174	1,036,408	299,413
Other rubber manufactures..	.....	125,748	.....	1,267,858
Totals	.....	$2,507,004	.....	$29,563,843

Rubber Goods Production Statistics

	1937	1936
TIRES AND TUBES	r Nov.	Nov.
Pneumatic casings:		
Production ...*thousands*	3,111	4,969
Shipments, total ...*thousands*	3,771	4,232
Domestic ...*thousands*	*	4,162
Stocks, end of month ...*thousands*	10,963	10,814
Inner Tubes:		
Production ...*thousands*	2,822	4,739
Shipments, total ...*thousands*	3,348	3,995
Domestic ...*thousands*	*	3,948
Stocks, end of month ...*thousands*	10,527	10,732
Raw material consumed:		
Fabrics ...*thous. of lbs.*	....	21,744
MISCELLANEOUS PRODUCTS		
Single and double texture proofed fabrics:		
Production ...*thous. of yds.*	2,285	3,672
Rubber and canvas footwear:		
Production, total ...*thous. of prs*	5,671	6,496
Tennis ...*thous. of prs.*	1,456	1,461
Waterproof ...*thous. of prs.*	4,216	5,035
Shipments, total ...*thous. of prs.*	5,143	6,502
Tennis ...*thous. of prs.*	648	588
Waterproof ...*thous. of prs.*	4,494	5,914
Shipments, domestic, total...*thous. of prs.*	5,111	6,464
Tennis ...*thous. of prs.*	636	557
Waterproof ...*thous. of prs.*	4,474	5,908
Stocks, total, end of month...*thous. of prs.*	20,308	13,425
Tennis ...*thous. of prs.*	6,916	4,654
Waterproof ...*thous. of prs.*	13,392	8,771

* Data not available.

The above figures have been adjusted to represent 100% of the industry based on reports received which represented 81% for 1936-37.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
†5,084	Collapsible pails and basins	Antwerp, Belgium
†5,087	Nursery toys	Cairo, Egypt
*5,095	Automobile accessories	Calcutta, India
*5,101	Toys	Mexico City, Mexico
*5,106	Bicycle accessories	Buenos Aires, Argentina
†5,111	Balata belting	Kaunas, Lithuania
†5,113	Rubber-sole cutter	Buenos Aires, Argentina
‡5,130	Druggists' sundries, gloves, rubber thread, and raincoats	Vienna, Austria
*5,140	Bicycle parts and accessories	Manila, P. I.
†5,144	Stationery supplies and novelties	London, England
†5,194	Bicycle accessories and parts, and toys	London, England
*5,202	Upholstery material, horsehair and rubber composition	Johannesburg, South Africa
*5,205	Miners' respirators	Amsterdam, Netherlands
‡5,207	Hospital supplies, and insulating sheets and rods of ebonite	Bombay, India
*5,226	Gas masks	Winnipeg, Canada
‡5,231	Rubber belting	Habana, Cuba
*5,236	Automobile accessories	Morges, Switzerland
‡5,237	Automobile accessories and parts	Colombo, Ceylon
¶5,238	Lampblack	Buenos Aires, Argentina
†5,265	Combs	Vienna, Austria
*5,273	Surgical rubber goods, gloves, syringes, and hard rubber articles	London, England
*5,274	Bathing caps, footwear, baby pants, surgeons' gloves, sponges, and bath articles	Buenos Aires, Argentina
*5,286	Balloons, novelties, soles and heels, and rubber cloth	Istanbul, Turkey

†Purchase. ‡Purchase and agency. *Agency. ¶Purchase or agency.

Imports by Customs Districts

	December, 1937 *Crude Rubber		December, 1936 *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	9,463,973	$1,671,560	11,215,117	$1,833,781
St. Lawrence	76	12	.....	.....
New York	106,588,451	17,279,737	81,539,206	12,944,663
Philadelphia	3,246,728	537,043	2,723,445	407,394
Maryland	14,853,416	2,483,163	5,772,037	906,145
Mobile	2,269,248	376,640	.....	.....
Georgia	.....	.....	108,655	16,712
New Orleans	8,107,631	1,358,252	2,595,661	399,606
Galveston	11,250	1,772	.....	.....
Los Angeles	10,781,157	1,700,970	9,156,543	1,454,643
San Francisco	279,947	43,001	379,532	52,529
Oregon	11,200	1,848	.....	.....
Ohio	258,100	63,924	117,417	14,616
Colorado	817,700	144,795	1,786,984	297,744
Totals	156,688,877	$25,662,717	115,394,597	$18,327,833

*Crude rubber including latex dry rubber content.